

NAVAJO NATION

Information Technology Plan 2007 - 2008

“Internet to the Hogan – Entering the Information Age”



by

The Department of Information Technology

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Harold Skow, Director of Information Technology

Window Rock, AZ 86515

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Introduction

The Navajo Nation strategic Information Technology (IT) roadmap is a high-level documentation. The intent of this roadmap is to be utilized in the IT design, implementation, deployment, and management within the Navajo Nation. The overall mission and goals are defined by derived guiding principals; these guiding principles are focused on a better service delivery to the Navajo Nation citizens. The strategic goals will be measured by our accomplished achievements on a quarterly and yearly basis.

Although the Navajo Nation is new to the Information Technology age, the rapid influx of technology implementation has prompted us to pave a roadmap. The Navajo Nation is behind in making optimal use of IT due to the lack of understanding of “Best Practices”, thus many are using “Best Effort “. This has caused many developed databases unable to integrate with other information resources; and the cost of revamping the databases is very high. The initial intent of sharing information is to assist in making wise informed management decision(s). Incomplete information derived from data stores lack data integration and can mislead management decisions and become costly.

It is essential that all entities within the Navajo Nation government involve in IT must work cooperatively and collaboratively to lay the correct foundation in order to achieve maximum return on their investments. This roadmap will include other plans such as the *Navajo Nation Architecture Plan*. The architecture plan can be used to determine how we can articulate our strategies and implementation of IT to achieve our goals. This plan will recognize where we are today; and allow planning to shorten the existing gap. The gap analysis would determine issues in regard to funding and training needs. Although these constraints exist today we can certainly produce plans to overcome these obstacles in the shortest time possible.

Technology changes on a rapid time scale. This overall Navajo Nation Strategic Roadmap will be dynamic enough to change as technology changes. *It has been quoted in global technical magazines that, “ technology planning now has to be in a shorter time-line”.*

The Navajo Nation will be striving to realize the great promises of IT achievements where it will enable our citizens to make use of technology; to reach out to the global environment. Many resources will become available as we enter the *global information age*. The intent is to become a valuable resource to our citizens and inspire public confidence and trust in our government.

The Navajo Nation Council approved the Plans of Operations for the Department of Information Technology which will layout the resolutions passed by our legislative body. These resolutions are part of our guiding principals, must be abided by, and enforced.

Another Navajo Nation resolution(s) is the Integrate Criminal Justice resolution, CAP-30-02, created to achieve a working relationship between other departments to implement IT within the Division of Public Safety. This resolution will be part of our guiding

principals. As we strive towards a Digital Navajo Nation government other guiding principals will be realized.

Content of the Plan

The Navajo tradition and culture has much to do with laying the values and assumptions that will drive what we want to achieve in IT implementation. From Chapter Houses to the central government Navajos still integrate traditional prayers in hopes of acquiring the best for our people. Values generated by our way of life will be the driving mechanism in this plan; integrated with current technology will also drive the implementation of IT.

The guiding principals is based on our values; defines the mission and goals and ultimately creating the strategic goals. Although our goals are in a broad sense and some in a more focused; the intent is to bring forward those with higher priority.

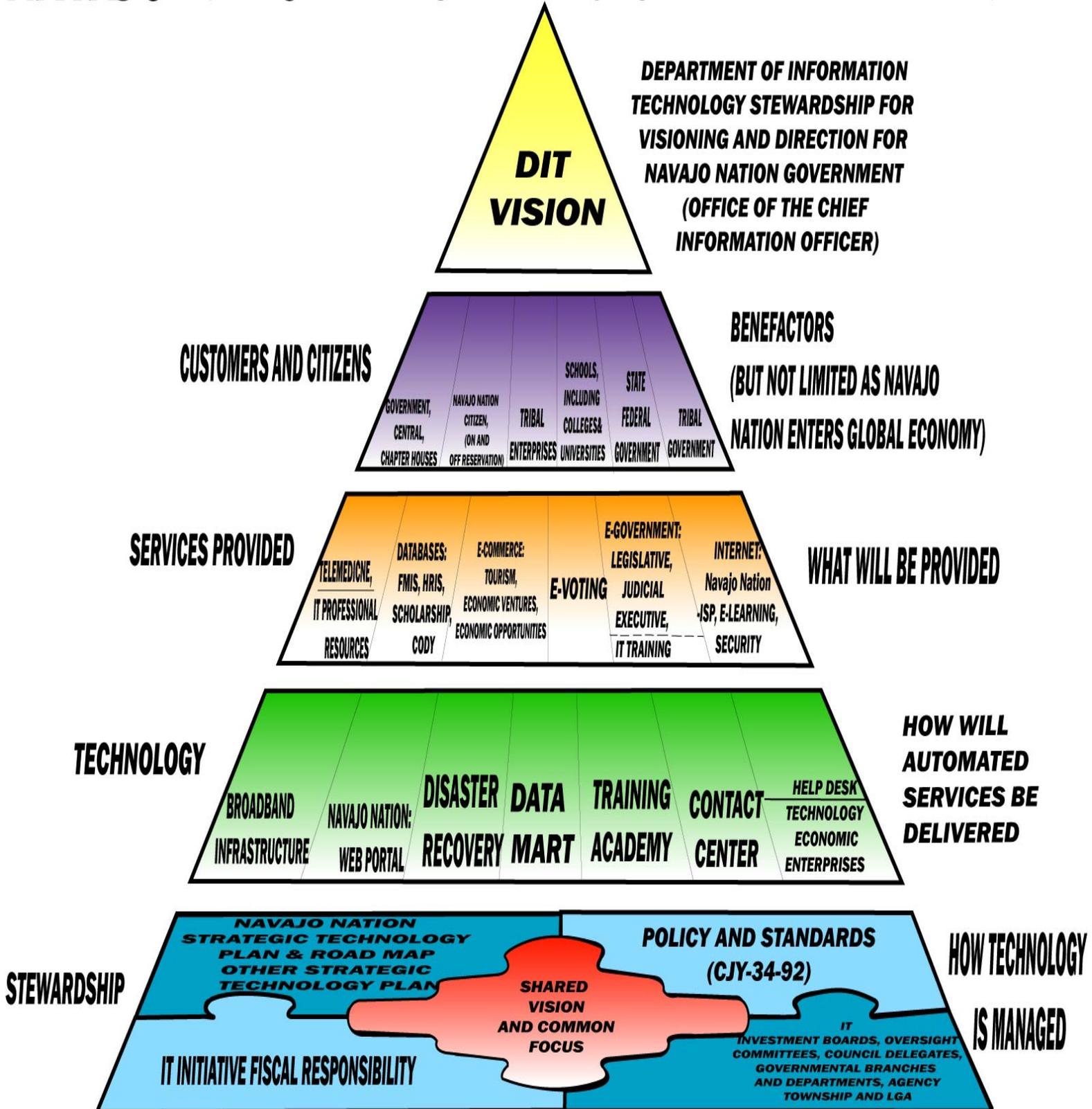
As the Navajo Nation Architecture is developed it will depict the gap that is between where we are now and where we should be. The Navajo Nation needs to plan very efficiently to catch up as rapidly as possible because technology advances will continue to increase in a linear fashion as we strive to shorten the gap. Although we may try to shorten the gap it will never disappear. Much of the effort to shorten the gap must be realize by all Navajo Nation governmental branches, divisions and departments. The gap analysis must be revisited on a continual basis to make ourselves IT aware.

The Department of Information Technology (DIT) will serve as the primary leader in setting enterprise wide policies and procedures for the Navajo Nation government. The plan of operations includes the “*Open Information Environment Act*”, CJY-34-92, that will provide specific technical policies. These specific policies must be dynamic enough to change as new technology and/or as new laws are introduced that require the change in policies. Subsequently, CJY-34-92 will need to be revised to reflect today’s IT environment for the Navajo Nation.

Navajo Nation DIT Strategic Plan Framework

DIT’s strategic plan framework for technology is depicted below. This framework encompasses all aspects of how we do business. The fundamental underlying framework is connecting the puzzle including: IT strategic plans, policies and standards, IT fiscal responsibility, governmental branches and most importantly a *shared vision and common focus*.

NAVAJO NATION DIT STRATEGIC PLAN FRAMEWORK



EXECUTIVE SUMMARY

The truest measure of a government's success is the value created for its citizen, communities and businesses. Now, more than ever, the Navajo Nation government relies on Information Technology (IT) to help maximize that value by making their services more efficient, useful, response and accessible. E-government is driving changes in Navajo Nation wide operations forward by providing access to government information and services. The Internet allows citizens to interact directly with government; bypassing frustrating bureaucracy, much red tape and many delays.

Modern times demand a high level of service from the Navajo Nation Government and have initiated a new era in secure information technology. Navajo Nation government not only directly serves citizens through their websites but is also starting to consolidate and share resources among agencies and chapters by aggregating networks and consolidating web sites through web portals. In addition, directly serving citizen changes the notion of 'customer'. While in the past, government personnel and business organization were the customers, now the Navajo Nation's definition of customer has expanded to include its citizenry. The intent is to provide connections throughout the reservation where information access is just a click away...where information services are streamlined and secure, and where citizens have an immediate voice in an open and energetic public forum.

Communications across the reservation are being enhanced through the use of broadband. Furthermore, the sophistication and sheer numbers of Internet users necessitates increased capability and intelligence at the website interface. This growing computer knowledge on the part of the public influences the government by affecting the move toward a paperless society. More than information is being transmitted; financial transactions are now on the Internet. Both procurement and payment using electronic means are being used today between Navajo Nation government and with citizenry. This introduces the important element of secure communications.

Viruses and worms can bring the Internet, and business with it, to its knees, and identity theft and privacy concerns are now every citizen's concern. Technology has become a strategic resource but can be a tactical vulnerability. Efforts are being focused on IT security and, specifically business continuity planning, to address these issues.

Indeed, timely communication of critical information plays an integral part of keeping Navajo Nation safe from natural and man-made disasters. When such disasters do occur, communication plays an even greater role in mitigating the impact of the disasters. Navajo Nation is leading efforts to prevent and respond to threats against Navajo Nation citizens, employees, and assets.

This government wide plan identifies and elaborates on the strategic IT goals for 2007, based largely on an extraction of Navajo Nation Executives' IT goals from past years combined with the Navajo Nation wide goals, an acknowledgement of existing trends in technology as well as those standards being promoted with the industry and by Department of Information Technology in its oversight role. Discussions with stakeholders also revealed concerns, issues and suggested directions for the future. Furthermore, Navajo Nation core values and guiding principles have laid the foundation for the overall focus and emphasis of the five adopted goals.

DIT's IT plans have been summarized in terms of trends, issues, goals and objectives in the formulation of this document. DIT's Strategic IT plan consolidates government wide trends and identifies strategic IT goals for the next three years. Reordering of last year's government wide IT goals was the result of the preponderance of agency goals dealing with Internet and e-government. Recommendations are also made based on review of the IT plans at the end of this document. Through successful IT planning, the Navajo Nation government will reap the benefits of agency IT programs that play a more cohesive role in agencies' fulfilling their missions and future visions.

Need for "Government IT Enabling"

The leadership of the Navajo Nation must ensure the government is "*Information Technology-Enabled*". The Navajo Nation Council has passed the resolution, CJY-34-92, in 1992 so that the flow of governmental information from the Chapter House to the central government and back could be achieved *utilizing modern information techniques and methods*.

The Navajo Nation Council passed the Integrated Criminal Justice System resolution to achieve a cooperative technology implementation between Public Safety, Judicial, and Prosecutor's office.

It is imperative The Office of the President/Vice-President ensures IT is a priority; and supports this technology plan in order to make the government "*IT Enabled*". All priorities indirectly make IT a priority.

Education and training on technology for all our government personnel would benefit the understanding of modern techniques and methods. Our leaders should treat IT as a resource just like oil, timber and coal. IT should be included as a necessary infrastructure in community and economic planning.

The key behind a successful implementation and use of today's technology is initiating *IT* the right way. Technology can be implemented in many different configurations to achieve the desired results. As specific policies are developed, this roadmap will enable our government to implement technology properly, and most beneficial cost savings. A team such as a creation of a *Navajo Nation Technology Investment Board* under the *Office of the Chief Information Officer* would determine if the technology is in the best

interest of the Nation and deter wasteful spending and redundant efforts. Such boards are established under the *Office of the Chief Information Officer*.

Another key to the successful creation of the Navajo Nation IT Strategic roadmap is to include involvement from senior executives from all branches, divisions, departments, other Navajo Nation IT entities, other agencies, Chapter House officials, Colleges and Universities within the Navajo Nation. The private industry should also be allowed to have input because the private industry can meet the needs of technology infrastructure. *The Department of Information Technology strategic plan includes holding the annual Navajo Nation IT Summit, which is key to the successful creation of the government wide strategic roadmap.*

Aligning IT with a Business Plan from the Office of the President

The Navajo Nation business plan from the Office of the President/Vice-President should be provided to align technology strategies. *The business need will drive the implementation of IT and not the other way round.*

The use of technology in the economic environment is far behind; any technology implementation is a positive advancement. Utilizing the correct or most efficient modern technique and methods needs to be adhered to.

The Department of Information Technology may derive IT needs from the President's priorities where IT initiatives are not clearly define. For example, current administration list education as a high priority. Education uses technology in every school and is used by all students from pre-school to Universities. Using this as a guiding mechanism DIT can align its short-term and long-term goals to achieve the desired results.

Another initiative is Public Safety. Governmental technology network can no longer be totally separate from the Navajo Nation citizens. All Navajo Nation citizens need technology access to the governmental network and information. Citizens need access to life-saving information and mechanism from the government.

Navajo Nation Values Driven Planning for Technology

The Navajo Nation culture and values will help shape the strategic plan, and provide

guidance in developing, implementing modern information technology within the Navajo Nation boundaries and beyond. The integration of values from our Nation combined with the intersecting state governments will provide a stronger use of technology.

- The Navajo Nation government and its citizens' to embrace the use of information technology (IT), improving the quality of life;
- The Navajo Nation government shall strive to provide reasonable access to all government information that is public information in nature;
- All IT initiatives must focus on the customer to deliver useful, accurate, and timely informational resources for all;
- IT decisions must be derived from cost-benefit analysis and cost-efficiency, business driven, long-term benefits, with an *enterprise solution in mind*;
- IT infrastructure must be implemented to promote access from citizens within the Navajo Nation as well as the private sector breaking barriers to economic development, social life style improvements, and governmental information red tape;
- IT must be viewed by all as a resource asset such as land, water, and minerals. This valuable resource must be used to make important government decisions where it will increase the efficiency and effectiveness of doing business;
- IT resources and implementation must help streamline processes to provide a more efficient government, increase our knowledge, broaden our reach to the outside world for all citizens of the Navajo Nation;
- The Navajo Nation must use innovation in developing and implementing technology to make our work environment and lively hood better;
- All important non-public information must be secure and protected with complete confidence using modern techniques to prevent fraud, misuse of information, protect privacy acts, and Navajo Nation's sovereignty;
- All electronic information must be shared based on business needs between governmental departments, branches, divisions, and other agencies;
- IT strategies and business plans between the executive level, divisions and departments must be aligned to achieve a most efficient result.

IT Strategic Planning

The Department of Information Technology (DIT) works with the three governmental branches, divisions, departments, agencies and other entities that encompass the Navajo Nation as a whole. DIT's strategic visioning is broad in scope. The broader scope of the Navajo Nation strategic roadmap includes the vision, goals, and objectives that are set for enterprise wide solutions.

The Navajo Nation strategic roadmap is formulated as the Nation grows to embrace new technologies and is recognized as the roadmap for technology guidance.

The Department of Information Technology seeks to:

Educate our government personnel and citizens by providing an environment that will support life-long learning opportunities, increase occupational skills, enable young Navajo students to achieve their maximum potential.

Strengthen our economic opportunities for all the Navajo Nation citizens and help implement positive regulatory systems.

Build a cooperative environment between overlapping states, the Navajo Nation government and other IT entities to achieve an IT infrastructure that will support and provide a wide spectrum of opportunities for all Navajos.

Prepare the Navajo Nation to meet the technical challenges of tomorrow, enter into the global information arena, today.

Promote information technology awareness and the implied understanding of the use of technology that it becomes a valuable social asset.

Protect the sovereignty of the Navajo Nation; to allowing enough access to broaden our minds and strengthen the Navajo Nation's economy as we enter into the global market.

Local IT Planning at the Window Rock Campus

The Department of Information Technology has created a short-term three year strategic IT plan for Year 2004 – 2006. (Attachment A). Amendment is made to include the 2007 – 2008 technical plan.

The local IT planning is the current technology infrastructure in the central government including the agencies. The immediate solutions that is necessary to bring the technology infrastructure up to speed; so employees can utilize the technology to communicate and better serve the citizens of the Navajo Nation. The IT infrastructure is lagging in the use and implementation of the most current technologies. The short-term IT planning will

address the areas where IT implementation is most needed. As the short-term IT planning is implemented by an increment of a year; the next year will only build upon the previous year.

The Navajo Nation endures budget constraints and hinders seeking its own solutions to determine if it is workable. Using proven methods from other entities and seeking the shortest and proven path of success must be used to succeed.

INTERNET TO THE HOGAN - Global Navajo Nation IT Planning

Internet to the Hogan technology initiative is a collaborative integration of technology vision and goals that includes the federal, state, local government, colleges within the Navajo Nation, consortiums of schools, and tribal government. The primary objective is to bring internet to the homes on the Navajo Nation so that the children can have access to the libraries, Navajo Citizens can acquire better provisioned services from the central and local government.

The broader vision of the IT Plan for the Navajo Nation intersects with three states, New Mexico, Arizona. Colorado borders the northeastern portion of the Navajo Nation that still has to be included due to the unique four (4) corners region. The users of IT within the boundaries of the Navajo Nation and the satellite communities Tohajiilee, Ramah and Alamo are under the broader IT planning.

The major constraint visible is the distance between each of the communities. The cost associated with IT infrastructure is very costly. Making cooperative alliances with other Navajo Nation IT entities, other agencies, the states, and the private sector is needed to achieve connecting these communities.

One method to create alliances through meetings and generating an understanding of shared vision and focus. The collaborative efforts will enable all available resource to be channeled to these areas. The Department of Information Technology's strategic short-term plan is to hold the Navajo Nation IT Summit annually that will allow for such interactions.

The long-term IT planning will be mostly determined by the availability of funds. Long-term solutions in IT planning will focus on enterprise solutions. Although the long-term missions, goals and objectives will be the focus but it has to be dynamic and flexible enough to change according to technology changes.

The bordering states offer assistants in formulation our own IT roadmap and we will absorb the proven successes.

The long-term vision:

Integration and interoperability must be the underlying factor for all IT initiatives.

1. Plan ahead five years on a continually basis.
2. Implementation of a primary network backbone for the Navajo Nation.
3. Plan to expand the second portion of the network from the primary backbone to reach the citizens at home.
4. Plan on viable application solutions to enhance government solutions such as database application(s), web portals, e-government, etc.
5. Plan for telemedicine and distance learning network capabilities to all parts of the Navajo Nation including the satellite communities.
6. Plan for a Navajo Nation technology center to house all IT activities for the Navajo Nation. This will include a training academy, IT project management office, software development, technology contractual services, Geographic Information Management center, skilled IT personnel resources, contact center and etc.
7. Continually support IT initiatives that can benefit the citizens of the Navajo Nation where the government will become digitize. Allowing e-government to be utilized for realistic business purposes.
8. Pursue President Bush's broadband initiative to implement broadband technology by year 2007.
9. To create economic and revenue generating IT businesses at the communities.
10. Initiate IT business ventures the Navajo Nation may determine a viable investment opportunity.

Digital Navajo Nation

The Navajo Nations' citizens, in large scale, live in remote areas on the reservation in a geographical area of 27,000 square miles. The local government, Chapter Houses, allows governmental activities to be carried out. A major percentage of governmental transactional activities are done in paper form.

The cost of driving from Chapter Houses, Agencies to and from the central government is a huge burden for clients that have limited financial resources; and rapidly depletes the Navajo Nation's governmental budget. The delivery of services and access to governmental information is at a snails pace.

The Department of Information Technology will support, promote and nurture web portal(s) to achieve a *Digital Navajo Nation* e-government and make driving a lesser option.

The Financial Information Management System (FMIS) is one example of how personnel with proper access can perform governmental financial activities from remote locations which in turn saves time and cost of travel. The result is a more productive workplace.

How to Become the Digital Navajo Nation

The Department of Information Technology must advise, promote, and nurture ideas; that allows governmental processes and services to become web enabled. All information

that is allowed for public access should become potentially web enabled. Some private and secure information must be protected from misuse and fraud; ensuring the protection of sovereignty issues.

DIT will also promote projects currently in process that implements web portal technology. The definition of the internet, intranet and extranet must be understood by all. The Local Area Network (LAN) within the Navajo Nation is our intranet. This intranet is protected by a secure environment managed by DIT.

DIT shall work diligently with State governments, Navajo Nation government, Local governments, Agencies and other IT entities and to share resources to implement the backbone network infrastructure. The Internet to the Hogan project is at the nucleus of this solution where many partners have dedicated their valuable resource and time to *diminish the digital divide*.

DIT has followed President Bush's broadband initiative to implement broadband to all in the continental US that is accessible and affordable. This initiative includes the Navajo Nation; DIT will pursue in creating partnership with the States; educational and health institutions; and private industry to accomplish the implementation of broadband technology by year 2007.

Moving towards e-government to make all Navajo Nation governmental services online and making it available 24 hours a day can increase services to the Navajo citizens and reduce costly driving time. Creating a "paperless" environment by deploying a signature database that stores a person's signature; and is securely accessible by password verification and validation of the user.

Mission and Statement of Purpose of Information Technology

The Department of Information Technology's primary purpose is to pursue and establish a stable, reliable, and readily accessible technology infrastructure; sufficiently meeting the Nation's needs in regard to: service provision for the people, competitiveness with similar entities, and implementation of progressively advancing technology.

Statement of Purpose

The Department of Information Technology (DIT) was established, within the Division of General Services, Executive Branch. The General Services Committee (GSC) of the Navajo Nation Council provides legislative oversight for the Department of Information Technology. The plan of operations outlines the specific duties of DIT.

DIT is a non profit entity solely responsible for many Navajo Nation technical support and services needed by the Navajo Nation government. DIT's responsibility includes the entire Navajo Nation geographic area totaling 27,000 square miles.

The key areas of activities are:

1. To carry out the directives of the Navajo Nation Council Resolution CJY-34-92, as amended which specifically mandates the creation of an "*Open Information Environment*" among the governmental entities of the Navajo Nation, and to assign responsible parties to coordinate the use and development of computer technology to achieve an open information-sharing environment.
2. To implement an overall computer information strategy which provides quality and timely computer related services to the programs, departments, divisions and branches of the Navajo Nation government.
3. To achieve distributed processing of selected financial transactions to the Agency and Chapter levels of the Navajo Nation government via computer technology.
4. To allow Agency and Chapter access to various Navajo Nation government data and information via computer technology.
5. To allow Agency and Chapter access to the "Internet" via computer technology.
6. Use modern computing techniques and methods to implement the latest technology.
7. Provide technical services to all Navajo Nation governmental processes and businesses.
8. Provide visioning, direction and leadership on Information Technology for the Navajo Nation as a whole.
9. Strategically implement and help all Navajo Nation governmental branches, departments, programs, and implement technology to achieve cost savings.
10. Coordinate with other department and agencies to implement Navajo Nation Council mandated resolutions to achieve desired results.

Guiding Principals

- Using technology, increase access to all governmental information for all Navajo Nation citizens and private sector, *while protecting our sovereignty and privacy.*

- Use information technology to improve all areas of the Navajo Nation business processes to increase efficiency and effectiveness.
- Use modern technical techniques to change and enhance the way we do governmental business.
- Become a social asset to the Navajo Nation and make contribution to increase the economic prosperity for all Navajos.
- Increase educational opportunities for all Navajo Nation citizens using technology; strive to implement distance learning for all.
- Use technological infrastructure to provide life-saving mechanism for all citizens of the Navajo Nation.

Key Strategic Goals

DIT strives to align its key goals with the Office of President/Vice-President's business plan. One of the priorities from OPVP is public safety and education. The fundamental infrastructure of today's education is network and computers. Having the infrastructure such as video conferencing at all schools; distance learning and building computer skills is possible.

1. **Goal 1: IT Reorganization.** An organization the size of the Navajo Nation government requires an enterprise IT structure with comprehensive direction from a Chief Information Officer or an entity where authoritative IT initiatives are disseminated.
 - 1.1 Current IT organizations, Department of Information Technology
 - 1.2 Current IT legislation, CJY-34-92
 - 1.3 Other IT legislations, Integrated Criminal Justice System.
 - 1.4 DIT reorganization.
 - 1.4.1 DIT reorganized to a Divisional level.
 - 1.4.2 DIT reorganized as an Office of the Chief Information Officer.
 - 1.5 Amend the Plans of Operations for DIT.
 - 1.6 Amend the CJY-34-92.
2. **Goal 2: Broadband Infrastructure Implementation.** The global technology is moving to broadband. Broadband is the fundamental IT structure necessary to access participation in the global economy.
 - 2.1 Cooperative groups between the Chief Information Officers of the four bordering states and the Navajo Nation.
 - 2.2 Broadband primary backbone.
 - 2.3 Broadband secondary backbone.
 - 2.4 Private entities participation.

- 2.5 Rights of Way (ROW)
- 2.6 Communication infrastructure ownership.
- 3. **Goal 3: Server Consolidation, Enterprise Agreements & Standardization:**
 - 3.1 Education the Divisions, departments, programs on IT methodologies.
 - 3.2 Initial scope of consolidation.
 - 3.3 Implement redundant environment at DIT computer room.
 - 3.4 Centralized network storage solution.
 - 3.4 Provide additional certified training to IT employees.
 - 3.5 Increase network up time to 99.9%.
 - 3.6 Build PCs internal to standardized.
 - 3.7 Purchase Enterprise Agreements.
- 4. **Goal 4: Security:**
 - 4.1 Implement a secure security infrastructure at DIT.
 - 4.2 Secure NN information to protect intrusions.
 - 4.3 Protect the NN sovereignty.
 - 4.4 Amend NN security policies as technology changes.
 - 4.5 Implement modern security techniques.
- 5. **Goal 5: Disaster Recovery Implementation:**
 - 5.1 Educate Branches, Division, departments, programs, Executive offices.
 - 5.2 Mission Critical servers and applications.
 - 5.3 Protection of sovereignty related information.
 - 5.4 Legacy paper environment.
 - 5.5 Conversion to digital.
 - 5.6 Disaster Recovery (DR) site.
 - 5.7 DR policy.
 - 5.8 Time of Recovery.
- 6. **Goal 6: Government Web Portal:**
 - 6.1 Introduce legislation for the Navajo Nation web portal.
 - 6.2 Offer a comprehensive suite of government and non-government services on the internet using the Navajo Nation web portal.
 - 6.3 Start projects to develop governmental service(s) portlets.
 - 6.4 Implement internet and intranet applications to streamline processes.
 - 6.5 Identify all areas of governmental processes to be slated for online projects.
 - 6.6 Develop a secure mechanism for intranet information.
 - 6.7 Ensure all web portal and portlets development are integrated.
 - 6.8 Create with the most current web methodology and techniques.
- 7. **Goal 7: Voice Over Internet Protocol (VoIP)**
 - 7.1 Implement the network infrastructure with Quality of Service.
 - 7.2 Educate Branches, Divisions, departments and programs on cost benefits.
 - 7.3 Adopt standards for VoIP.

- 7.4 Train skilled workers to control and provide VoIP services to the NN.
- 7.5 Share resources with agencies and other entities to leverage infrastructure.
- 7.6 Adopt new laws and regulation(s) from FCC regarding E-911 services.

Goals, Strategies and Methods

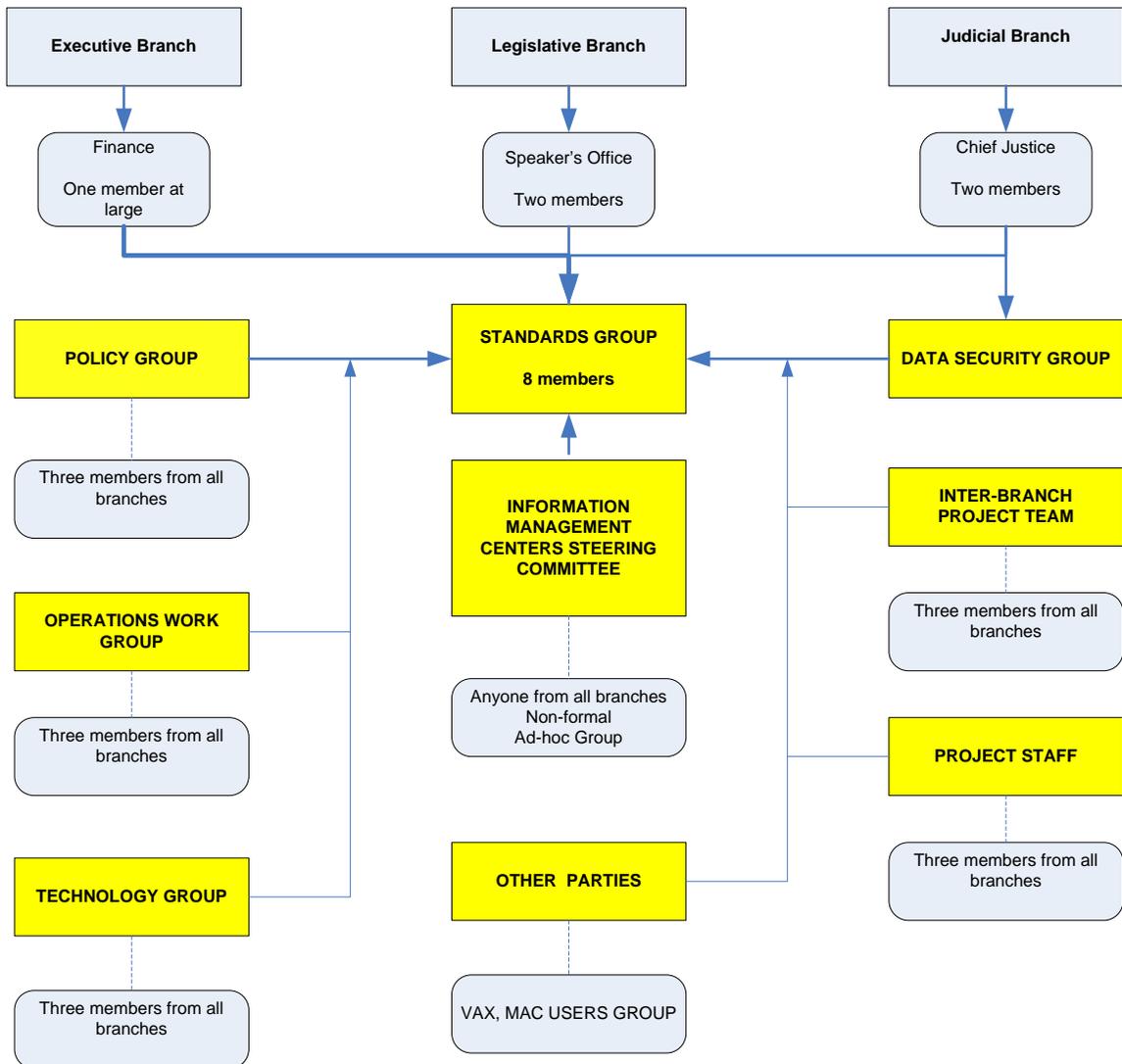
Goal 1: IT Reorganization. An organization with the scope and magnitude of the Navajo Nation needs an enterprise IT structure with a specifically designated Information Technology office and a Chief Information Officer (CIO) to lead this office. This allows for dissemination of comprehensive direction from the CIO and implements a strategy where authoritative IT initiatives are formulated, implemented and monitored to successful completion.

- 1.1 **Current IT Organization** - Department of Information Technology.
 - 1.1.1 Analyze new form(s) of governmental organizational structure(s) that will have proven successful track records in other organizations with emphasis on technology.
 - 1.1.2 Continually seek ways to improve service delivery to the citizens of the Navajo Nation.
 - 1.1.3 Restructure the IT organization to achieve accountability. DIT should have authoritative direction where IT initiatives and policies are followed. Compliance of IT policies within the Navajo Nation government must be implemented to achieve an overall given direction where the Navajo Nation IT roadmap is followed.
 - 1.1.4 Implement a sub-committee to develop standards and policies, and oversee the approval of new IT initiatives. Create data stewardship groups, IT professional groups, and etc.
 - 1.1.5 Structure the IT organizational structure where the IT organization can be self supporting. Acquire funds for assessments on the sustainability of different IT structures. i.e. Navajo Nation IT Enterprise, Office of the Chief Information Office and Division of Information Technology. Implement a fund management account where the IT entity can:
 - charge for services,
 - make and sell PCs to the governmental departments and to the private sector,
 - become an ISP provider and sell internet services to the governmental departments and the private sector,
 - provide professional IT services to all governmental entities and the private sector,

- implement a Point of Presence (POP) to generate funds from Navajo Nation internal programs and entities external to the Navajo Nation and ultimately, keep the funds within the Navajo Nation,
- hire professional Navajo Nation IT personnel to provide services and build up the IT skills of the Navajo people,
- Create a network operating center (NOC) that will provide failover and disaster recovery capabilities for the Navajo Nation and private entities. This will also be a revenue generation mechanism,
- Not limited to the above list.

1.2 **Current IT legislation, CJY-34-92**

1.2.1 Analyze current legislation, CJY-34-92. Amend the Open Information Environment resolution to reflect current organizational structure of the Navajo Nation government. Revise the resolution to fit an IT organizational structure where the core concept remains intact while the underlying policies and the *concept of information sharing and the use of modern methods and techniques* procedures are dynamic to the point where it will keep up with the rapid changes of technology. Underlying policies and standards should change as technology changes. This task should be the under the control of the Chief Information Officer.



The groups defined in the CJY-34-92 were mostly the same people from the three branches. Also the steering committee members were an ad hoc group with no accountability. These groups had no definitive functions.

The proposed organizational structure below, 1.5.1, shows how the groups become functions under the Office of the Chief Information Officer.

- 1.2.2 Amend the resolution to emphasize *the use of modern methods and techniques*. Strive to implement the “Best Practices” in technology while applying economic restraint.

- 1.2.3 Amend the resolution so that non-compliance of the resolution has accountability and consequences.
 - 1.2.4 Amend the resolution so the following is accomplished among the branches, divisions, departments and programs. Resource sharing, coordination, and cost savings being emphasized.
 - 1.2.5 Amend the resolution to eliminate redundancy in purchases, IT projects, IT centers, IT personnel resources and all other IT pertinent items.
- 1.3 **Other IT legislation(s), Integrated Criminal Justice System.**
- 1.3.1 Coordinate with other Navajo Nation legislation(s) that was created by the council that directly has implications or implementation of Information Technology.
 - 1.3.2 Provide professional service(s) to achieve the intended outcome(s) for other branches, divisions, departments and programs. Strive to implement solution(s) that are long-term and enterprise level.
 - 1.3.3 Strive to use modern methods and techniques to help save time and money, utilize and maximize existing infrastructure, implement best-practices and help improve government services by streamlining services using technology.
- 1.4 **DIT reorganization.** Implementation of organizational change is long-term. The lack of funding for assessments and analytical evaluation of sustainability is a constraint. Utilizing existing internal resources, previous IT assessment(s), input from the Navajo Nation end-users of technology, Navajo Nation IT summits, and external resource(s) will initially form a starting point to analytical process.
- 1.4.1 DIT reorganized to a Divisional level via OCIO. This option will reorganize DIT to be parallel with other Divisions. This will only be viable if the Plans of Operations (POO) or legislation allow DIT to acquire directive authority on technology issues.
 - 1.4.1.1 Assessment is needed for viability and sustainability. Construction of the POO and other Navajo Nation legislation and the resulting contents will determine the outcome to be viable.
 - 1.4.1.2 Analytical models and assessments are needed. Successful business model(s) and existing governmental IT

reorganization efforts will be helpful in ensuring the success of the new IT organization.

- 1.4.1.3 Analytical projections of sustainability are needed. Analytical projections would not be based on a financial aspect but more on the mechanism of carrying out the required activities in the POO. The projection would show the amount of man power required to meet the needs and demands.
- 1.4.1.4 The Navajo Nation council approval process is a key element of this process. It would be the council delegates who determine final approval and mandate of the reorganization of IT. An amended CJY-34-92 would be the key and provide the fundamental structure. All aspects of this important IT organizational structure, with all the proper IT committees and groups need developing.
- 1.4.1.5 Funds for assessments and evaluations are needed. The reorganized IT organization would and should have ample funding to obtain IT assessments to properly direct its operation.

1.4.2 DIT reorganized as an Office of the Chief Information Officer. Many governmental organizations have implemented an Office of the Chief Information Officer and are very successful.

1.4.2.1 Definition and Understanding of the Office of the Chief Information Officer (OCIO).

CIOs (Chief Information Officer) are senior executives responsible for all aspects of their companies' information technology systems. In this case it will be for the Navajo Nation. The CIO would direct the use of IT to support the Nation's goals with the use of subcommittees. For example, a *Navajo Nation Information Technology Investment Board* to decide which technology is in the best interest for our government. With knowledge of both technology and business process' and a cross-functional perspective, the CIO would manage aligning the Nation's technology deployment strategy with the business strategy of the Office of the President/Vice-President. The CIO would oversee technology purchases, technology implementation and various related services provided by the Department of

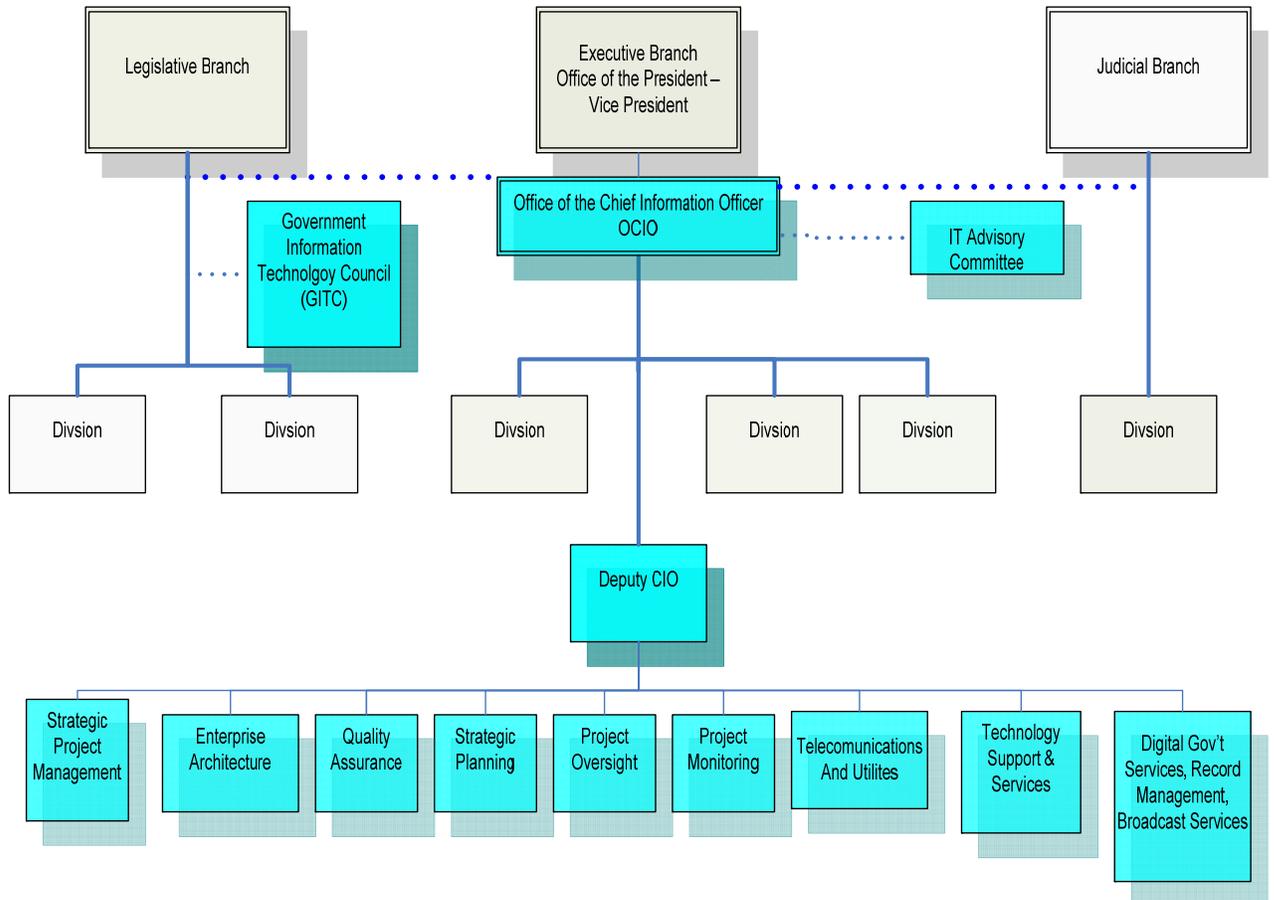
Information Technology (DIT). All IT related projects must be managed by DIT and the resulting data submitted to the CIO. The CIO would delegate many of the tactical and operational issues to a "trusted person" such as a Technology Deputy in order to focus on more strategic concerns for the Nation.

The "information" part of the CIO's job is very important. The effective and strategic use of common enterprise-wide information requires a cross-functional perspective. The CIO will take the leadership role in reengineering the governmental organizational business processes and the underpinning IT infrastructures to achieve more productive, efficient and valuable use of information within the Navajo Nation. Another major role is to take the leadership role in knowledge management and the valuation of intellectual capital.

CIOs usually report to the Chief Executive Officer (CEO), Chief Operations Officer (COO) or Chief Financial Officer (CFO) and in this case it will be an oversight committee. The CIO will have a seat on the executive steering committee to allow guidance and decision making input on the direction and implementation of IT matters.

1.4.2.2 Office of the Chief Information Officer (OCIO)

Develop the proposal to implement an OCIO. Use the resolution CJY-34-92 as the core resolution and place the DIT under the OCIO.



The Navajo Nation council passed this law in 1992 to create an *Open Information Environment* within the Navajo Nation government. DIT has developed a Navajo Nation Technology Plan. This is an overall plan that is in the process of focusing on enterprise solutions. For example, the Voice over Internet Protocol (VoIP) build out plan is almost completed. This will be used Navajo Nation wide, technology policies will be introduced for approval from the oversight committees, wide-scaled Navajo Nation broadband plan build out to be used by the government and the citizens of the Navajo Nation, and etc.

The solution for many of these issues is to create an Office of the Chief Information Officer (OCIO) within the Navajo Nation.

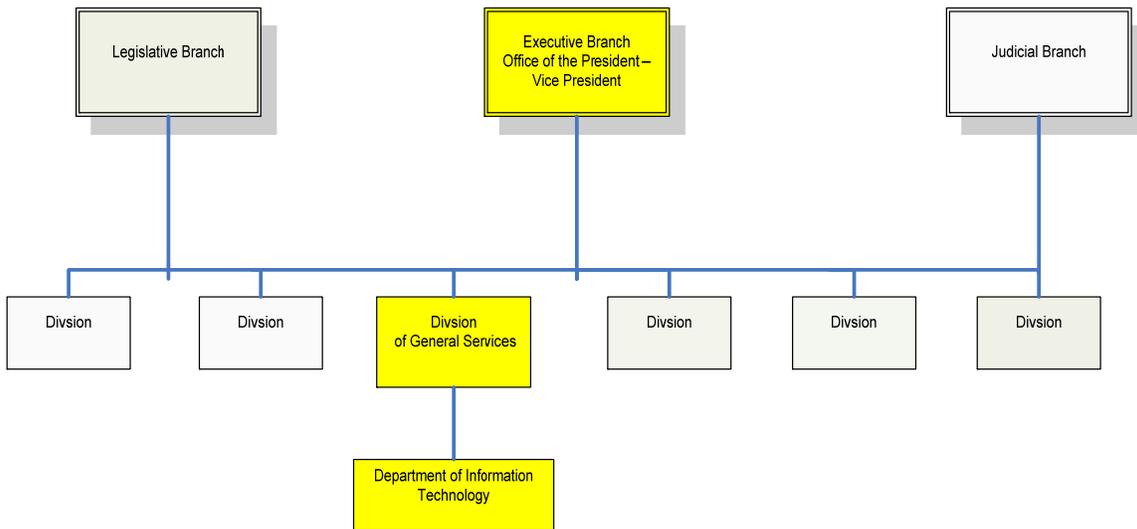
- The Chief Information Officer will reside under the Executive Branch along with the Office of the Controller in the organizational structure.
- OCIO needs to have an Information Technology (IT) advisory committee made up of several members. This committee would have the ability to make IT decisions, to evaluate technology initiatives, provide decisions to the CIO, scrutinize department and program IT budgets and have several members with voting powers and one with no voting power.

- The OCIO will coordinate technology direction across all three Navajo Nation branches.
- A Government Information Technology Council (GITC) under the Legislative Branch will have oversight of OCIO. GITC will provide oversight of the OCIO, approve/disapprove
- IT policies and standards, create IT legislation and resolutions, and approve/disapprove IT budgets and provide recommendations.

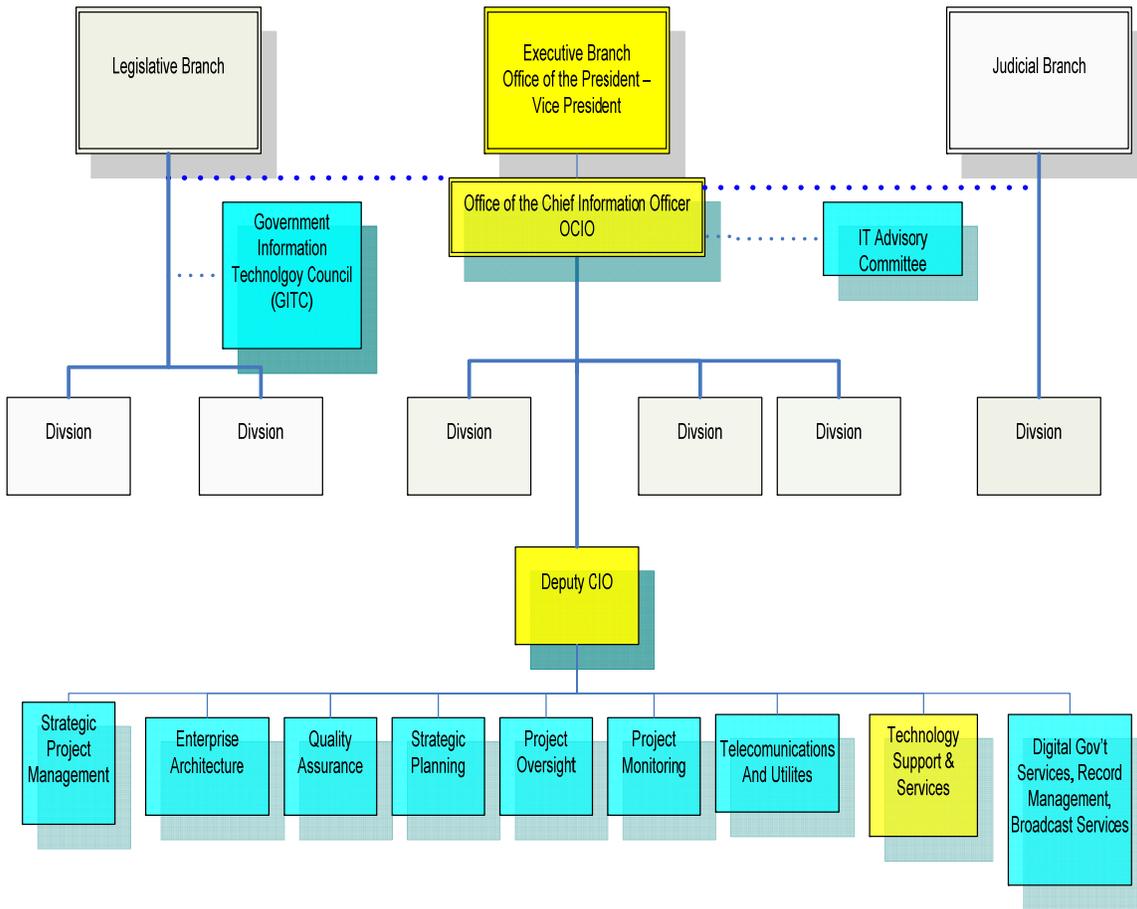
1.5 Amend the Plans of Operations for DIT.

1.5.1 Amend the Plans of Operations for DIT to reflect the current organizational structure. The CJY-43-92 was passed by the Navajo Nation Council in 1992. DIT was Computer Services when the resolution was passed. The new organizational structure needs to reflect the content of the resolution and POO.

Current:



Proposed:



1.6 Amend the CJY-34-92. IT organizational structure with proper content such as IT committees and proper language for use by all government branches, divisions, department, programs and agencies needs to be added. The core content of the resolution should stay in tact and allow the attached policies and standards to change as technology changes. Other means and directives changes occur from global IT changes and changes in laws.

2.0 Goal 2: Broadband Infrastructure Implementation.

The global technology is moving to broadband. Broadband is the fundamental IT structure necessary to access participation in the global economy. Voice, video and data will be transmitted over the broadband infrastructure. Voice over Internet Protocol (VoIP) would save much needed funds and all calls would be transmitted over the Internet Protocol with no fees, video conferencing for telemedicine, distance learning, e-government and global economic opportunities can be realized.

QUAD STATE-NAVAJO NATION COOPERATIVE BROADBAND WORKING GROUP

EXECUTIVE SUMMARY

"We ought to have a universal, affordable access for broadband technology by the year 2007, and then we ought to make as sure as soon as possible thereafter, consumers have got plenty of choices when it comes to purchasing the broadband carrier". President George Bush, speech delivered in Albuquerque, NM (Mar 2004).

Infrastructure that is essential to the economic viability of rural areas has always been a critical element that directly affects progress. The growing need for high speed telecommunications has become critical infrastructure to rural Americans. Many of the economic impediments of our past may be addressed today through the use of technology and access to high speed communications. The ability to establish a "virtual presence" throughout broad regions using new generation broadband networks is rapidly removing the barriers to education, health care, government, emergency services, public safety, judicial, and many other services by leveraging internet-based technology – while at the same time collapsing the time, distance and cost issues associated with those engagement processes.

The Navajo Nation is determined to initiate a plan to implement high-speed services as a means of establishing a whole new level of economic vitality inclusive of four (4) states, the Navajo Nation, the Navajo Tribal Utility Authority, which is an enterprise utility company of the Navajo Nation, and all other groups with vested telecom initiatives. We envision building this economic platform not just within the Navajo Nation, but also in the context of how the Nation interacts with all its bounding neighbors. The vision is to create a Quad State-Navajo Nation Cooperative Broadband Working Group (CBWG) as a first step to regionally address and overcome issues as they relate to the following requirements areas:

- Telecommunications Infrastructure Requirements - including
 - o Access and bandwidth needs
 - o Connectivity and redundancy
 - o Security
 - o Technology and standards
 - o Regulatory
- Interoperability
- Network evolution and continuous improvement
- Funding mechanisms strategy
- Total costs ownership – Navajo Nation

As a two tiered organization, the CBWG consists of an Executive Committee and Working Level Committee whose subject matter expertise will be used to address and recommend solutions to relevant issues at hand. The Executive Committee is envisioned to be comprised of representatives assigned by the Chief Information Officers (or equivalent) of Arizona, Colorado, New Mexico, and Utah, who may also arrange the assignment of Working Level Committee members as deemed necessary to address individual agency concerns (e.g., public safety, health care, education, etc.) as they relate to the agency requirements areas above.

Information sharing and cooperation through this organization is paramount to overcoming the issues we all face today. This collective effort will add a significant support base for obtaining the resources needed to collectively address our broadband deficit as a regional problem rather than many local ones.

Navajo Nation Quad-State Broadband Executive Group's Mission Statement and Goals

To promote broadband technology within the Navajo Nation for use by all citizen living in and the surrounding area. To help conjoin and link states encompassing the Navajo Nation with entities within the Navajo Nation.

Goals

- *Work with State Governors office to strategically make progress.*
- *Work with Navajo Nation entities and IT consortiums to create partnerships and strategic alliances.*
- *Increase access to world-wide intellectual knowledge for all Navajos.*
- *Increase economic opportunities to the global economy for all Navajos.*

Year 2004

- Navajo Nation IT Summit 2004 to include broadband topics.
- Meet with the four (4) state Governors office and discuss Navajo Nation proportional section on current state-wide projects. Discuss cost sharing, resource sharing and partnership.
- Meet with Navajo Nation IT entities and discuss cost sharing, resource and partnerships.
- Obtain a consultant group to work with the Executive Group for professional services.

Year 2005

- Navajo Nation IT Summit 2005 to include the Quad-State Broadband initiative focus group.
- Obtain funds for project planning and assessment through cost and resource sharing.
- Initiate a Navajo Nation wide infrastructure assessment for the RFP in the first quarter.
- Conduct resource sharing and cost sharing with the Executive Group, Office of the President and Navajo Nation entities in the first quarter.
- Submit the RFP for the broadband initiative.
- Select a vendor for the broadband initiative.
- Create a Navajo Nation IT Consultant group to work with the vendor of choice for the broadband initiative.
- Creating the infrastructure backbone.
- Obtain a Disaster Recovery (DR) plan and 10 acre site acquisition north of Gallup.

Year 2006

- Navajo Nation IT Summit 2006. Attendees will be all *the Internet to the Hogan* partners, all governmental branches, departments, programs, chapter houses and all other entities on the Navajo Nation with vested interest in Information Technology (IT).
- Assess the primary infrastructure backbone to target goals in the first quarter.
- Continuously seek and obtain funding for the project from Federal, State, Tribal government, E-Rate, and other entities.
- Light up and test a corridor.
- Contracted with AT&T to provide Internet Service Provider with two OC3 connectivity to the Department of Information Technology's network.
- Connect one chapter house, White Rock Chapter, with a T1 high speed network
- Develop the Navajo Nation (NN) Technology center with the Disaster Recovery center.
- Connect a high bandwidth from the NN Technology center to the nearby high speed telecommunication access along I-40.

Year 2007

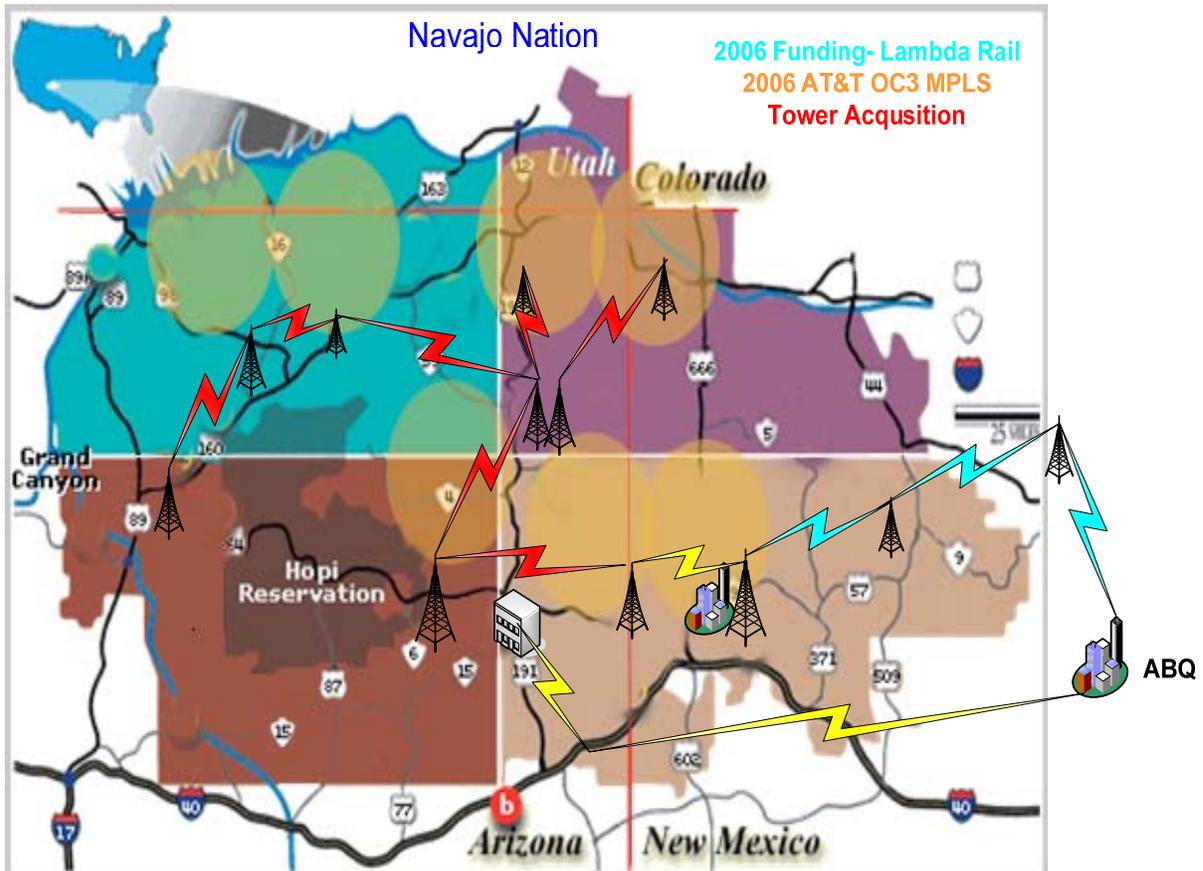
- Navajo Nation IT Summit 2007 . Attendees will be all *the Internet to the Hogan* partners, all governmental branches, departments, programs, chapter houses and all other entities on the Navajo Nation with vested interest in Information Technology (IT).
- Light up and test as many corridor in a joint effort across the Navajo Nation and externally to the Universities. The Lambda Rail with a OC3 bandwidth coming from the University of New Mexico to the Navajo Technical College in Crownpoint, NM will be the initial construction of the Navajo Nation broadband backbone.
- The acquirement of the nine communication towers located in very important strategic locations on the Navajo Nation. The nine towers will be established with residency with radio communication the fall of 2007. These communication towers will have an OC3 bandwidth that will eventually be connected to the Lambda Rail.
- Established connectivity between the Navajo Technical College OC3 network to the Window Rock Summit towers and back to the Department of Information Technology's primary network.

Year 2008

- Navajo Nation IT Summit 2008 to include the Quad-State Broadband initiative focus group.

- Light up and test as many corridor in a joint effort across the Navajo Nation and externally to the Universities.
-

- 2.1 Cooperative groups between the Chief Information Officers (CIO) of the four bordering states and the Navajo Nation. The Navajo Nation must interact with the CIO office to acquire and obtain resources.
- 2.2 Broadband primary backbone. Obtain a broadband communication infrastructure across the Navajo Nation to be used by all. Create partnerships and strategic alliances to share resources to implement broadband. The amount of bandwidth must be enough to meet the needs of all the citizens of the Navajo Nation. Technical assessment to ascertain projected needs for the future is required. The type of equipment would be terrestrial infrastructure such as fiber, radio and wireless access points.



1. The () yellow communications lines have been installed in 2006 to Department of Information Technology's primary network. This connectivity has two OC3 with 2 DS3 activated. As requirements are needed for the users on the Navajo Nation it is scalable and robust.

This connectivity is currently used by and for:

- Contract with the FTS2001 contract for telecommunication / internet protocol. This is a GSA contract and signed by the current president of the Navajo Nation.
- Enterprise level technology computer room facility at the Department of Information Technology in Window Rock, AZ main campus.



The Uninterruptible Power Supply (UPS) located at DIT's Computer Room. Scalable to handle all Navajo Nation requirements of a fail-safe environment.



The UPS was installed in FY2006. It has been tested when DIT's building got hit with a lightning last fall. The UPS and surge protection protected all the mission critical servers and data without any damage or loss.

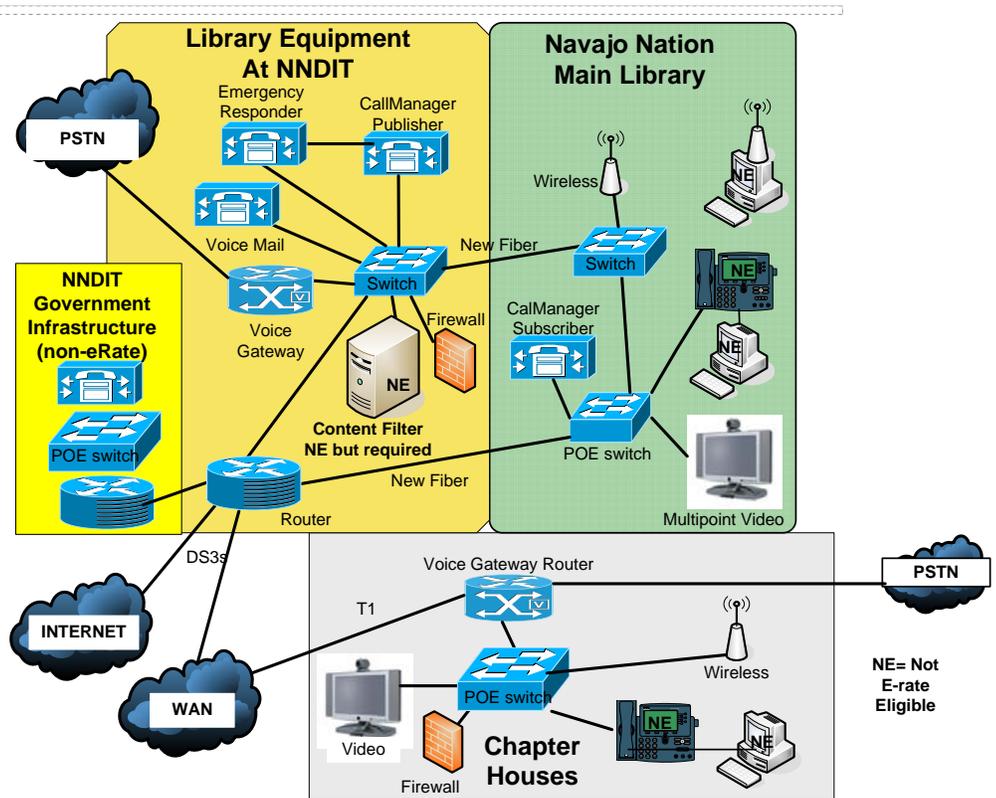
The halon gas fire suppression system to protect all servers and equipment.



In June 2006 a fan belt from the HVAC started smoking and the halon gas automatically sent an alarm and then release the gas to suppress any fire. This halon system is in the process of an upgrade to a newer system.

Navajo Nation Department of Information Technology's CISCO Voice over Internet Protocol configuration. The implementation of VoIP at DIT's central hub is designed for all Navajo Nation branches, division, departments, programs, chapter houses and other entities within the Nation.

Central Window Rock to Chapter Houses

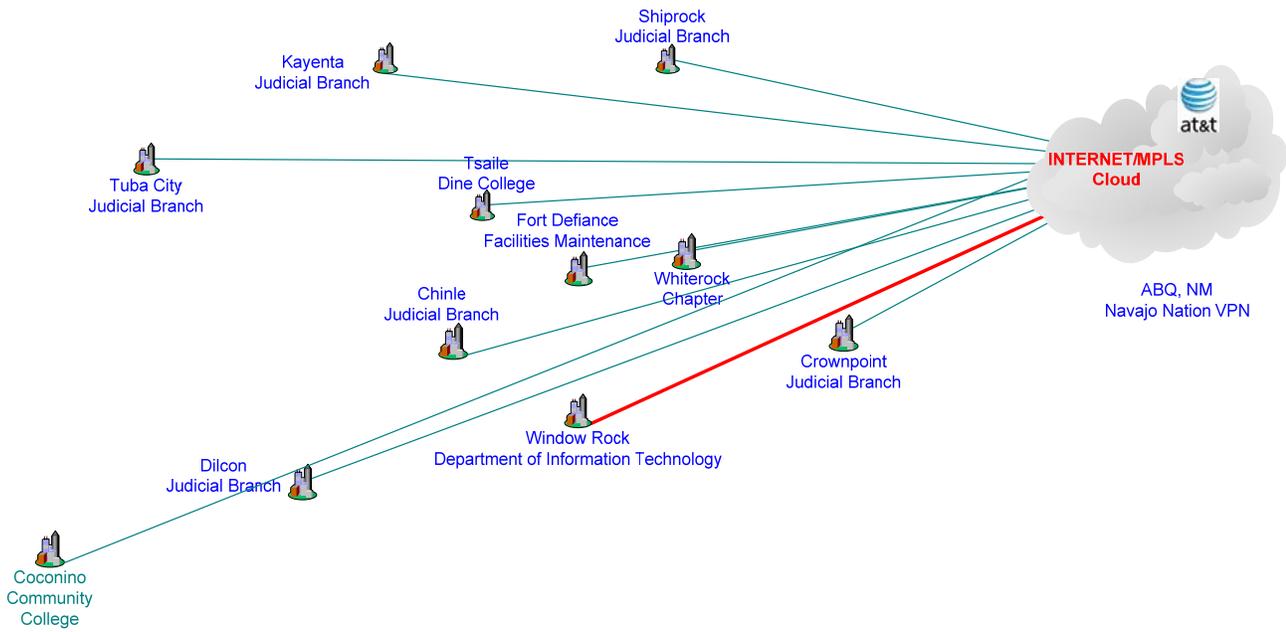


The network consist of two OC3 155 mbps bandwidth and T1 1.5mbps. The remote connectivity uses microwave radios to bring high-speed broadband for internet, televideo and VoIP.

The Navajo Nation AT&T MPLS network. Remote sites are connected with T1 lines. The main trunk from DIT to Albuquerque AT&T MPLS is an OC3. (155mbps)



**Navajo Nation INTERNET/MPLS Cloud
Wide Area Network Infrastructure**
(Branches, Department, Programs, other Entities)

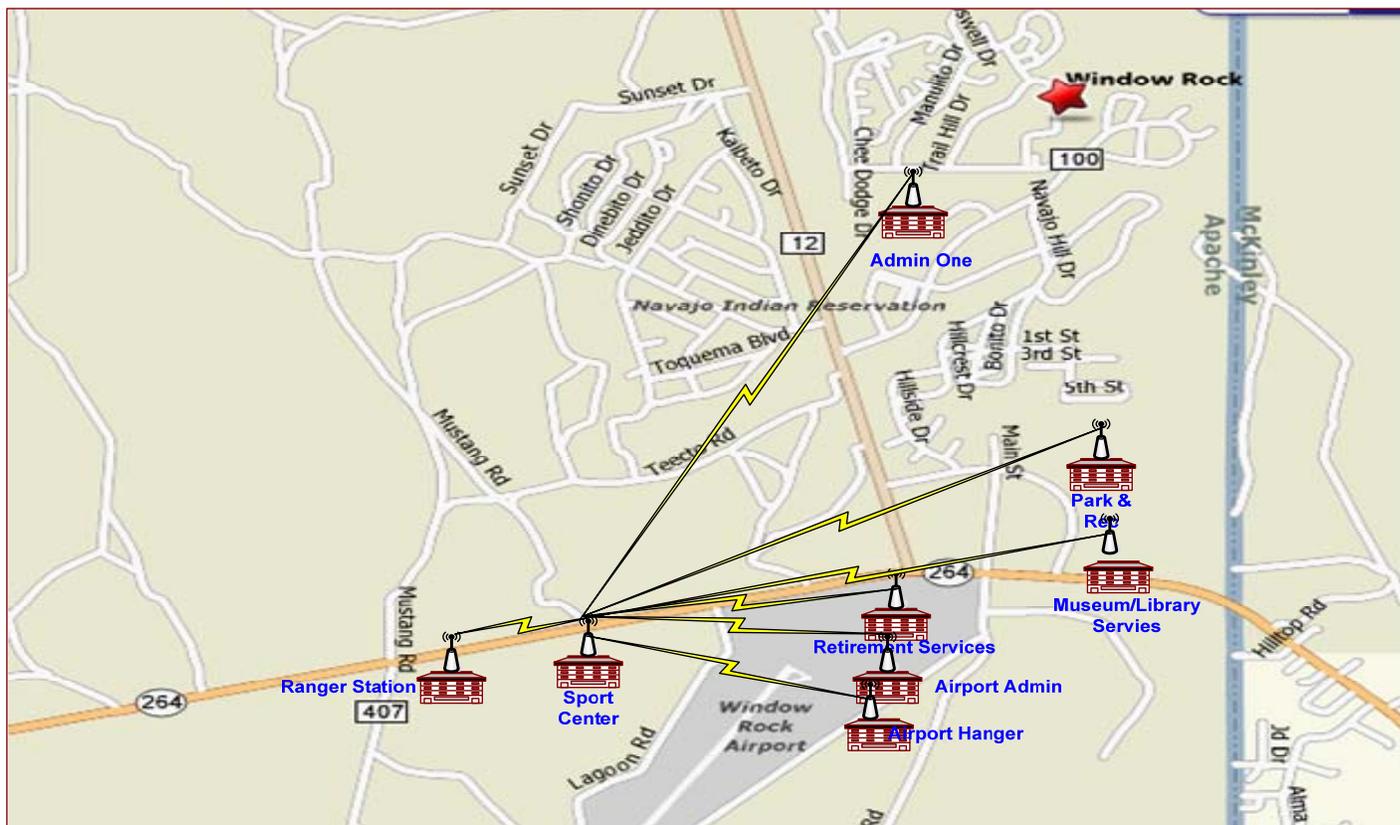


NN network – rev 1 (6/11/07)

Wireless Network in Window Rock Campus.



Navajo Nation Local Area Wireless Network



- All 6,000 Navajo Nation governmental users.
- High-speed internet 45 mbps and scalable.
- Video conferencing for all branches, departments, programs, chapter houses, colleges on the nation, chapter houses and other entities.



- Centralized email services.
- Protected environment for all secure documents behind a firewall.
- Use of the Multiple Protocol Line Switching (MPLS) for multi point connections instead of a one point-to-point.
- Telemedicine use.
- Distance Learning enabled. Coconino Community College and Dine College are currently connected to the Navajo MPLS network.
- Fiber network from DIT to Albuquerque AT&T point of presence.
- Microwave tower connection from St. Michaels summit to Deszha Bluff in Tohatchi, NM. Microwave from Tohatchi, NM Deszha Bluff to Crownpoint Frontier tower. Microwave radios from Crownpoint, NM tower to White Rock "H" frame tower.

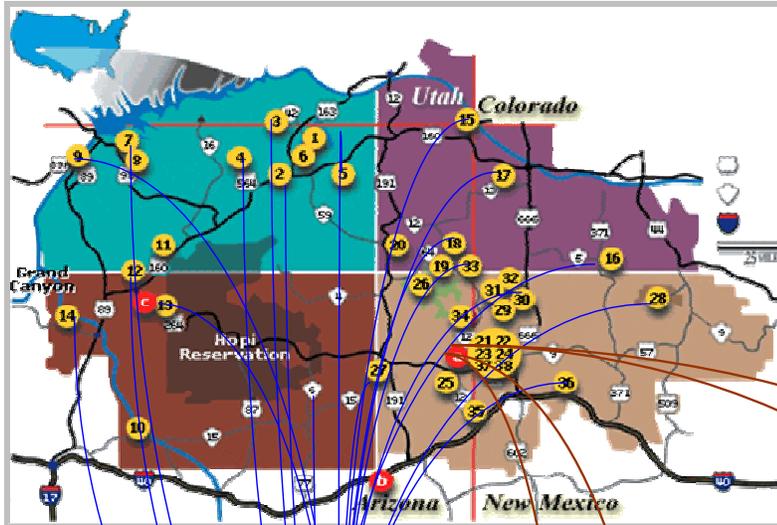


- The White Rock Chapter house the first to connect to the Navajo Nation MPLS network with a high-speed T1 line. White Rock chapter does have

any telephone lines so they now use the DIT's Voice over Internet Protocol (VoIP) network for their *telephone uses everyday*.



The infrastructure will be a majority owned and managed by the Navajo Nation people. Memorandum of Agreements between other federal, state and tribal entities would be necessary to achieve interoperability.



Navajo Nation Fully-Mesh Network will connect all 110 Chapter House, tribal departments, branches, agencies, libraries, schools, etc.

DS3 Dedicated Internet
28 T-1 lines

COST SHARED BY ALL NN DEPARTMENTS, PROGRAMS, SCHOOLS, ETC.

FTS2001 Contract
T-1 cost \$300 - \$600 est monthly
AT & T Cloud MPLS Network

DS3 Bandwidth
28 T-1 lines

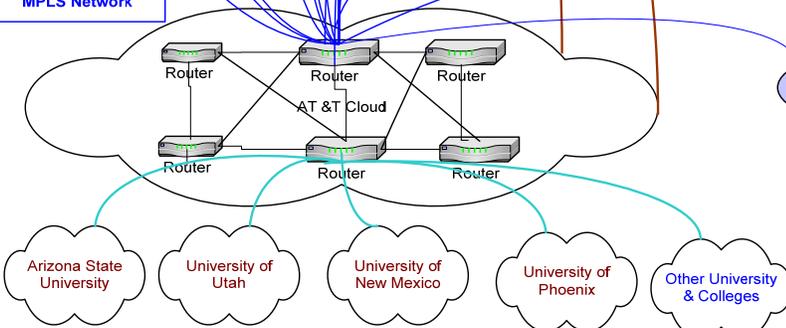
Washington DC Office

Tohajali

Ramah

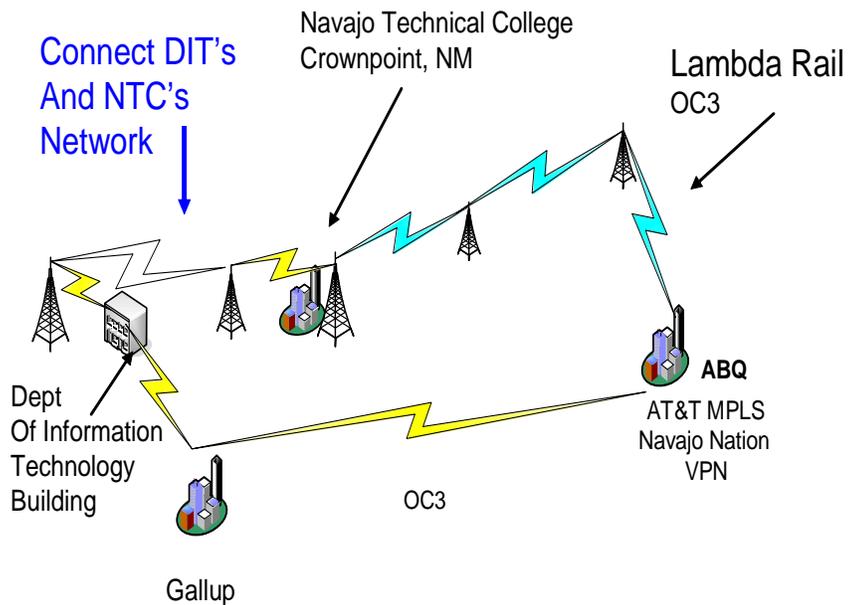
Alamo

World Wide Web (WWW)



Voice, Video and data transmission will be transmitted on the infrastructure. This should meet the needs of all schools, colleges, central government, agencies and chapter houses.

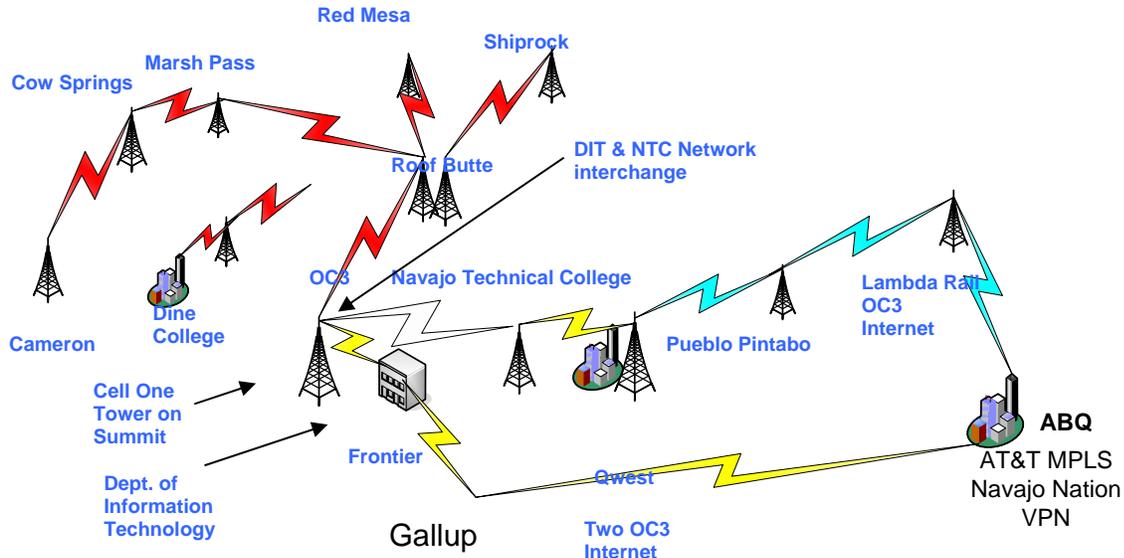
2. The () turquoise communication connectivity is the Lambda Rail broadband. This was accomplished by acquiring funding from the State of New Mexico. This is part of the Internet to the Hogan broadband project. The state funding was 1.8 million of dollars. Currently this has an OC3 45mbps connectivity. The Navajo Nation and Navajo Technical College have the same vision of bringing high-speed broadband internet to the citizens on the Navajo Nation. With the funding year 2007 and 2008 DIT will connect the OC3 broadband from Crownpoint, NM to St. Michael summit tower and then to DIT's primary network.



- 2.3 Broadband secondary backbone. This is the last leg implementation to reach the people living on the Navajo reservation in remote areas. As MOA's between different entities are made it will become possible to reach the people along with other funding. Funding the last leg to reach the people should always be planned in all projections.

Radios, wireless access points and fiber should be used.

- 2.4 The () red communications links depicts the nine towers that will be donated to the Navajo Nation in FY 2007. Once the OC3 is connected from NTC it will then be connected going into the northern portion of Arizona. Canopy technology will be implemented to reach Chapter Houses and the community.



From Roof Butte another connection will be connected to the Mathews Peak tower. The tower on Mathews Peak will be upgraded to have solar power. Currently it is a pass-through connectivity. This will connect to the Dine College in Tsalie campus.

- 2.5 Private entities participation. Private entities can offer other means to acquire broadband from its owned services they provide. Private entities can also enter into collocation of its resources to assist in the implementation of broadband.
- 2.6 Rights of Way (ROW). ROW is a constraint that deters the implementation of broadband services to the citizens of the Navajo Nation. Stream lining the ROW process is a key goal to achieve a shorter time line to acquire terrestrial infrastructure.
- 2.7 Total Cost Ownership. One of the key goal would be to lower the Total Cost Ownership (TCO). The Return on Investment (ROI) must be realized to successful operate our government successful. Lower the cost and saving much needed funds is ideal.

External sources must be limited and increasing our technical resources to manage the broadband infrastructure is ideal.

3. Goal 3: Sever Consolidation, Enterprise Agreements & Standardization:

All Navajo Nation governmental branches, divisions, departments, programs, chapter house and other entities that rely on the Navajo Nation government for monetary support needs to scrutinize and realign their technology initiatives with a large focus on consolidation.

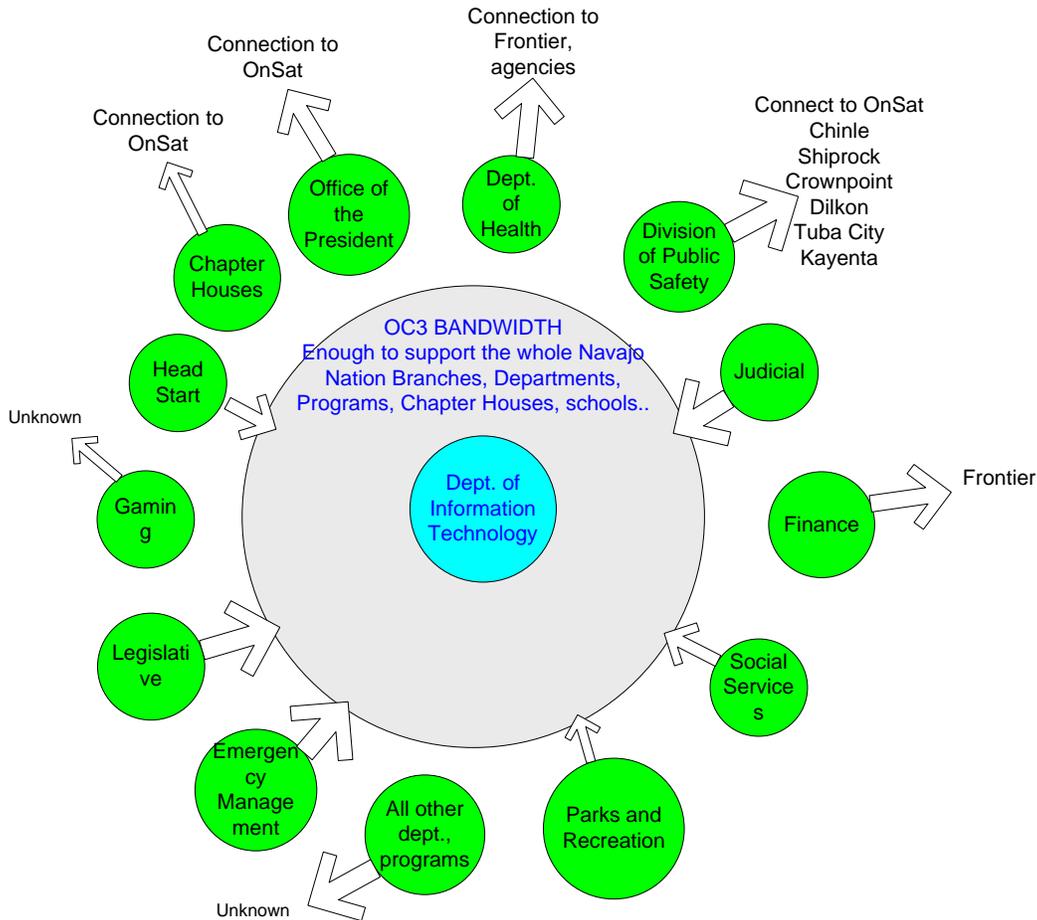
Consolidation will allow for government Information Technology **(IT) Rightsizing**. By optimizing current government-wide IT spending through consolidation and application sharing.

Consolidation can also help **ITCost Cutting** by implementing strategic application sharing and integrating governmental processes.

Many redundant efforts can be eliminated to help alleviate budget challenges by rightsizing and IT cost cutting that will allow for reinvestment in productivity-enhancing technology initiatives. These efforts will help:

- Lower processing costs
- Reduced customer service costs through self-service transactions
- Better provisioned services
- Reduced travel and training expenses
- Etc.

Current IT Implementation withing the Navajo Nation (example)



Results:

1. Unnecessary wastful spending of funds
2. No collaborative effort on technology – no combined effort strategies
3. No interoperability – stove pipe applications environment
4. Lacks communication – email servers don’t communicate
5. Unproductive environment
6. Stove-pipe technology vision – short sighted
7. File servers can’t communicated with each other
8. Not able to have a Nation wide digital signature database
9. No centralized server environment – lacks communication
10. No Disaster Recovery as a whole
11. Different Internet Service Provider (ISP) – disjointed environment
12. Poor internet bandwidth – unsatisfied end users (customers)
13. Deters economic development
14. No augmentation of services – Navajo citizens receive less services
15. etc..

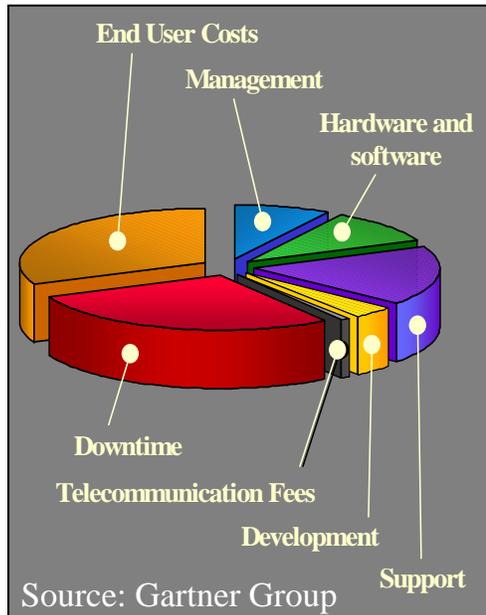
Proposed IT Implementation withing the Navajo Nation



Results:

1. Alignment of one technology vision – holistic vision
2. Sharing of resource for one big bandwidth – OC3 and T1 to Crownpoint, Shiprock, Chinle, Dilkon, Ft. Defiance, Kayenta and Tuba City
3. High-speed internet – satisfied users, customers
4. One email server – everyone can communicated
5. More productive environment – realization of mission and goals
6. A holistic disaster recovery environment – all mission critical data is safe guarded
7. One Internet Service Provider (ISP) – reduced cost and save money
8. Implement Voice over the Internet (VoIP) for all – make telephone calls for free
9. Implement and integrate the E911 – integrated approach solution
10. Able to implement Telemedicine and Distanced Learning
11. Create enterprise software agreements – save money
12. Implement a secure environment – protect Navajo sovereignty
13. More effective use and management of IT assest and investments
14. Diminished duplication of IT services
15. Augmented delivery of government services to benefit citizens
16. Promotion of economic development
17. etc...

Return On Investment by creating Enterprise Agreements (EA)



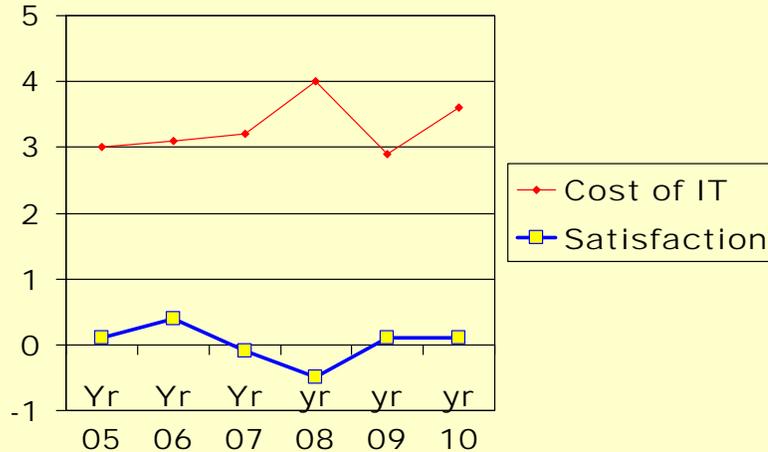
- **Total Cost Ownership (TCO) is made up of multiple elements. License cost is often only 5 to 7%**
- **Enterprise Agreement provides volume discounts**
 - **BUT discounting only produces a small portion of total cost savings**
 - **(Example: 10% software license discount = .05% in TCO)**
- **Enterprise Agreement focus on other cost saving areas such as;**
 - **Enterprise standards**
 - **Simple administration**
 - **License compliance**
 - **Reduced Support & Training**

The cost of not consolidating is depicted in the graph below. The expenditures of each governmental entities with it's own IT initiatives is depicted in the upper graph line. The blue color depicts the satisfaction from expenditures on IT. IT expenditures create an inverse reaction that is not satisfactory.

NO CONSOLIDATION

Navajo Nation – Total Cost of Ownership (TCO).
No return on investment and much wasted money.

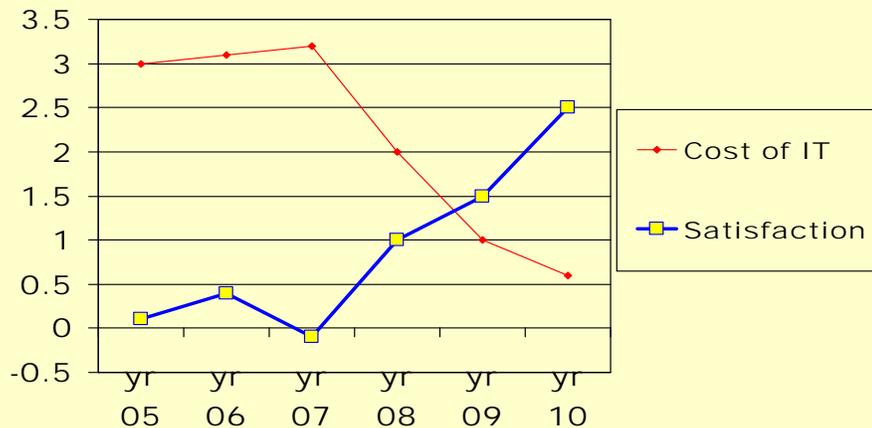
Millions
of
Dollars



CONSOLIDATED ENVIRONMENT

Consolidation will increase satisfaction level and
lowers the cost. A return on investment (ROI) is
shown

Millions of
Dollars



- 3.1 Education the Divisions, departments, programs on IT methodologies. Provide proper education to all governmental branches, divisions, departments, programs and agencies on IT methodologies by providing educational opportunities. One way is to hold the Navajo Nation IT

summit yearly and hold other IT meetings to provide opportunities to learn new technology from external entities such as companies, universities, federal and state governments.

- 3.2 Initial scope of consolidation. The south and east campus of the Navajo Nation government has fiber network. The three branches, majority of division, many departments and programs have access to the fiber network. DIT's computer room facility has ample sample to house all tribal department and programs servers. Servers such as email servers, file servers, application servers, web servers can be relocated in DIT's computer room facility.

Centralizing and consolidating servers will save much needed funds, consolidate the management of servers, housed in a safe environment with proper protection from fire, water and other external unforeseen environmental dangers.

All servers will be protected by a redundant firewall against virus and intrusions.

- 3.3 Implement redundant environment at DIT computer room facility. Two OC3 connectivity from AT&T with scalability to be used by all Navajo Nation branches, departments, programs, chapter houses and other entities.

(picture of DIT computer room)

Redundant servers (firewall, switches, application servers, web servers, etc.) with fail-over provide continuous connectivity without interruptions.

- 3.4 Centralized network storage solution. DIT will provide a Internet Protocol Storage Network Appliance (IP SAN) solution. The network storage appliance will can be located on the Navajo Nation fiber network apart from the hardware (servers). Terabytes of storage can be configured to houses all Navajo Nation data in a central place.

A SAN solution will provide a fail-safe environment. If a server completely crashes the data will not be harmed and will be on-line in a matter of seconds if a fail-over hardware (server) is configured.

The SAN solution will also allow for a Disaster Recovery configuration in another remote location and provide a quick backup mechanism.

- 3.5 Provide additional certified training to IT employees. Meet current training needs by bringing IT training courses to the Navajo Nation and sharing cost. Create a permanent IT training academy and possibly have native personnel become trainers.

- 3.6 Build PCs internally to standardize. Build all PCs by the Navajo Nation to save much needed funds, provide and implement standardization by building the same type of PCs. All tribal branches, departments, programs, agencies and chapter houses would be required to purchase these PCs internally.

Navajo Nation employees would provide the Service Level Agreements to maintain and service all the hardware and software to strengthen our IT skills endowment and provide economic opportunities.

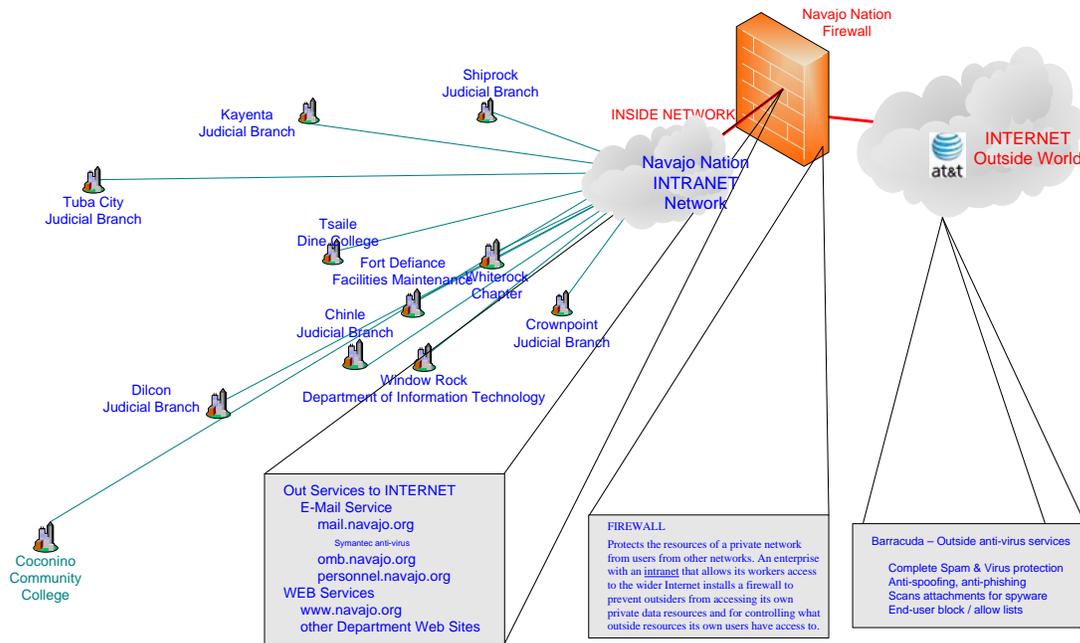
- 3.7 Purchase Enterprise Agreements (EA). Enter into EAs to save much needed monies. Purchase EAs for:
- Microsoft OEMs
 - Anti-virus software license
 - Microsoft SQL Server license
 - Server licenses
 - Oracle Database Licenses
 - Firewall license
 - MS Development Software Licenses
 - Datamart licenses
 - GIS software Licenses
 - Internet ISP
 - Etc.

4. **Goal 4: Security: All Navajo Nation data must be protected and secure. The Policy and Standards on security is part of the Navajo Nation policy.**

- 4.1 Implement a secure security infrastructure. Firewalls must be installed and configured correctly to protect the Navajo Nation data from any misuse from external intrusion and unauthorized access internally.



Navajo Nation Wide Area Network Infrastructure
(Branches, Department, Programs, other Entities)



NN network – rev 1 (6/11/07)

- 4.2 Secure NN information against intrusions. Install firewalls to protect against external intrusions and install intrusion detection mechanisms. A procedure to continually check the procedure(s) on intrusion detection and hardware including the firewall software.
- 4.3 Protect the NN sovereignty. All methods and procedures to protect Navajo Nation information must be taken. This includes information on email servers, application servers and file servers. Other critical servers that store any NN data must be protected from external sources to protect the NN sovereignty.

Unauthorized access can obtain information such as legal documents and executive information. All NN stored on any type of server must be kept within the Navajo Nation internal network.
- 4.4 Amend NN security policies as technology changes. Hardware and software changes that effect the control of programs on hardware for security requires constant monitoring of security policies.
- 4.5 Implement modern security techniques. Obtain must current information from security technical committees, federal agencies, state agencies and security bulletins.

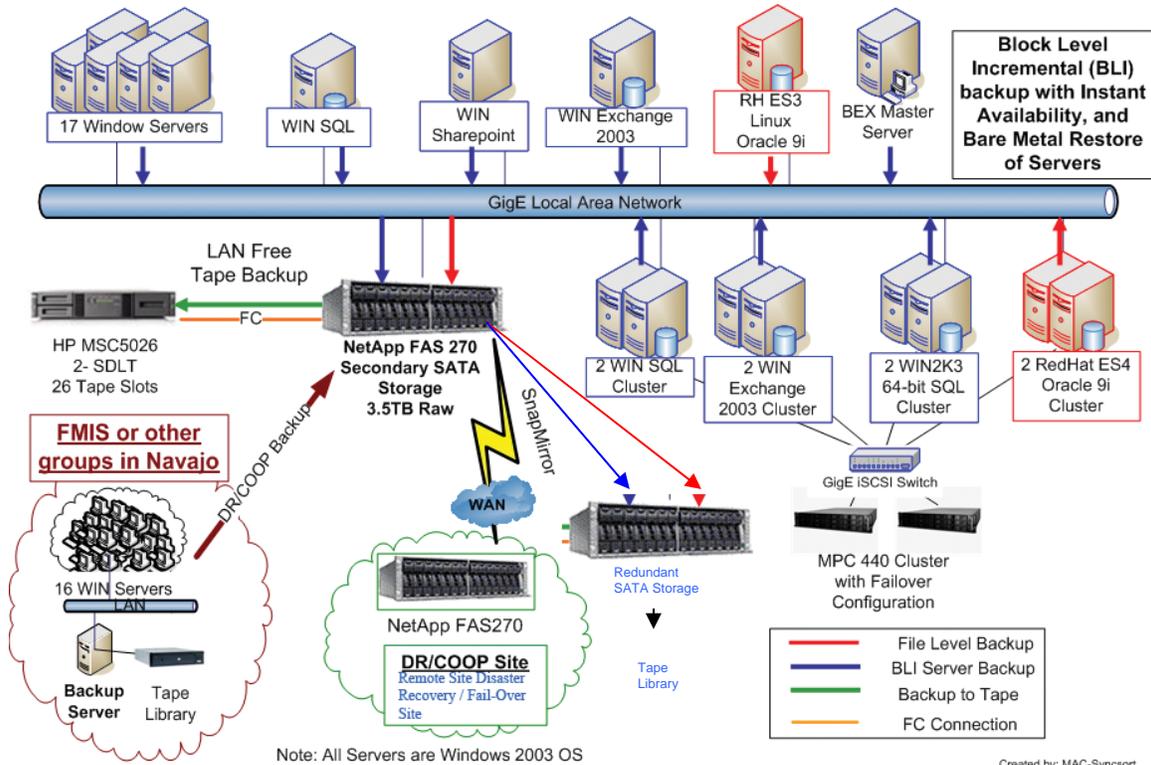
5 Goal 5: Disaster Recovery (DR) Implementation: DR is essential to protect mission critical information.

- 5.1 Educate Branches, Division, departments, programs, Executive offices. Provide technical education programs on a continuous basis for all NN employees.
- 5.2 Mission critical servers and applications. All critical information that must be used to operate the NN government without interruption must have a DR plan in place. Information loss that can disrupt the operation of the NN government should be defined as mission critical. Financial and Human Resource Information systems are critical applications.

A backup and recovery must be in place for all servers such as email servers, file servers, application servers, web servers, etc. The backup and recovery plan must be tested on a continuous basis.

An enterprise DR plan also must be implemented. A redundant off site storage mechanism must to develop. The DR recovery site must be able to have all the required hardware, security, power, technical personnel and service level agreements in place to restore all information require in a timely manner or provide a fail-over system within a matter of seconds. All fail-over systems must be tested to so that no data is lost.

Navajo Department of Information Technology Proposed Backup Architecture



- 5.3 Protection of sovereignty related information. All information at the DR site must be protected against unauthorized access. On line fail-over system must develop monitoring system at the application level to detect unauthorized access to any data.
- 5.4 Legacy paper environment. All critical information stored on paper format must start to develop plans to migrate to digitally store applications. This could be in the form of transactional databases or scanned documents stored into database.

DIT will obtain a digital signature database for governmental use. All memorandums and documents that require signatures will be accomplished by the signature software. Everyone that signs documents will initially sign a device with a digital recorder and provide user information for security. Once the signature is recorded and saved, a person will be able to right click on a document for the signature validation. This can be accomplished where internet access is available.

- 5.5 Conversion to digital environment for memorandums and other governmental documents. Creating plans to digitize NN information is important. Digital information can be shared in many ways to make our government more efficient. Digital stored information can be placed in a DR center and restore in a matter of seconds and be made available for use.
- 5.6 Disaster Recovery (DR) site. An enterprise DR site for the NN is essential and important to recovery any loss information. All DR site have:
- Secured building
 - Redundant network
 - Technical resources available 24 hours x 7 days week x 365 days per year.
 - Service level agreements (SLA) in place to restore any system, data or information in a matter of seconds.
 - SLA to provide fail-over systems at all times for all mission critical systems and applications.
 - Redundant power
 - Etc.
- 5.7 DR policy. A NN DR site must in develop with policies and procedures. It is critical to create DR plans and policies for the NN Financial Management Information System (FMIS) and the Human Resource Information System (HRIS). All other mission critical information or servers must be covered by the DR policy.
- 5.8 Time of recovery. It is important to test the fail-over systems at a DR site. The time of recovery must be tested to guarantee a successful fail-over without any loss of data. FMIS and HRIS servers should fail-over to a DR site and provide immediate access without any disruption of service. The fail-over should take place in a matter of seconds.

Other system and application may allow the time of recovery more time even though they are critical but SLAs needs to be in place. But the recovery of information must be guaranteed.

6. Goal 6: Governmental Web Portal

- 6.1 Introduce legislation for the Navajo Nation Web Portal
- 6.1.1 Create legislation for the “Official” use, and authentic representation of the Navajo Nation Government, its services and products.

- 6.2 Offer a comprehensive suite of government and non-government services on the internet using the Navajo Nation Web Portal.
 - 6.2.1 Develop an integrated “User-Friendly”, web-based information portal that is easily assessable to all project web-based applications and information resources. The customized portal will feature a secure, web-based administration function to manage all parts of the portal system.
 - 6.2.2 Establish Web-hosting services for the Navajo Nation.
 - 6.2.3 Web portal application includes E-commerce, E-government, E-job search/bank, E-training, E-voting, E-Learning, computer systems & internet security, distance learning, and video broadcasting.
- 6.3 Develop a Data Mart for data storage and repository.
 - 6.3.1 Establish a center for data storage and repository management.
- 6.4 Start projects to develop governmental service(s) portlets.
 - 6.4.1 Create mini-portal links for content information and management in the areas of health, housing, education, employment, business, tourism, cultural, maps/driving direction, natural resources, election info/voting (national, state, local), rural/urban planning (LGA), Infrastructure (utilities, telecommunication, transportation), child care, elderly care, special needs care, agricultural (animals & farming), and to buy or sell items.
- 6.5 Implement internet and intranet applications to streamline processes.
 - 6.5.1 Governmental information access includes public information, internal communications, data resource sharing, forms servicing, interdepartmental document sharing, contract administration, grants administration, training, technical assistance, laws, resolutions, regulations, and codes.
- 6.6 Identify all areas of governmental processes to be slated for online projects.
 - 6.6.1 Design departmental websites, e-government applications, and databases capable of on-line sharing of information amongst other governmental entities and to the general public.

- 6.7 Develop a secure mechanism for intranet information.
 - 6.7.1 Develop and maintain a secured user access point to protect confidential information.
 - 6.7.2 Data Mart to follow strict confidentiality policies in regard to information, adhering to all security level access plans.

- 6.8 Ensure all web portal and portlets developed are integrated.
 - 6.8.1 DIT shall recommend, create, and develop Departmental and Program links that are compatible to the Web Portal.
 - 6.8.2 Links from the Web Portal to outside websites to be included.

- 6.9 Create with the most current web methodology and techniques.
 - 6.9.1 A design and structure of a “User-Friendly” customized Web Portal has been complete, funding procurement to develop the Web Portal is currently underway.

Goal 7: Voice over Internet Protocol (VoIP)

VoIP is changing the way we live today globally. Traditional telephones are being replaced by VoIP. VoIP is a way of transmitting voice over the internet. The same internet we use for our computers. The communications line to use VoIP is connected globally. DIT is strategically working with other Divisions where VoIP is being implemented. The intent is to implement the same type of hardware and software for VoIP. At some point in time, as each division acquires VoIP they will be connected with the Call Centers.

As the citizens of the Navajo Nation get connectivity to the homes much needed voice communication becomes possible. Traditional telephone lines entails constraints on high cost and rights of way issues. VoIP can be brought to homes their radios, fiber and satellite communications vs the traditional terrestrial lines.

Navajo Nation Initial VoIP Network Enhancement Plan

This document is the initial written Voice over Internet Protocol (VoIP) plan for the Navajo Nation. It includes preliminary information and recommendations that are subject to change as the process continues. It is a working document that will incorporate additional findings, clarifications, and adopt comments made by the Navajo Nation Communications and Utilities Department and the Department of Information and Technology. In this document any Navajo Nation branch, office, department or division can be referred to as a “department”.

Space is provided in the binder for Navajo Nation provided documentation on their own systems, such as the Cisco VoIP systems they own.

Since the initial outline plan was submitted, the focus of Navajo Nation efforts has been on obtaining a Voice over Internet Protocol provider. Alternatives to this method of providing telephone service are reviewed in this document but the most of the time and effort has been on supporting the VoIP RFP process and the financial and technical issues related to VoIP service from a provider.

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SECTION 1.0 EXECUTIVE SUMMARY

Businesses, governments and other organizations are continually confronted with choices in running their enterprises. One element is their communication infrastructure. Increasingly, the online element (e.g. email and web applications) of their operation is becoming more important. Telephone service is still the major method of communication. Changes to telephone service are usually considered if they can save money and/or make the organization more efficient and productive.

The Navajo Nation Communications and Utilities Department (NNCUD) administers the voice communication policies and the majority of telephone expenses for the Navajo Nation government. NNCUD feels there is potential to save telephone expenses and provide new communication tools by changing the telephone system. Communications and Utilities has partnered with the Department of Information Technology (NNDIT) to review of Voice over Internet Protocol (VoIP) telephone service. It is their finding that VoIP has become the industry standard for telephone communication systems and that the Navajo Nation should take the necessary steps to implement VoIP in governmental offices in a systematic way. It is recognized that major upgrades to many offices will be required to take advantage of VoIP and that telephone savings could assist with the funding as well as other funds that are directed to improving the online capabilities of the Navajo Nation.

TELEPHONE SERVICE CHOICES

The three prominent choices to provide voice communication to the Navajo Nation are (1) continuing to be served by telephone company Centrex services, (2) convert to Navajo Nation owned and operated VoIP private phone systems that are department based or (3) use a VoIP service provider who can serve all departments at any site. A combination of these services could be used. Traditional PBX phone systems are not considered advisable. The preferred method is to use a VoIP service provider.

ALTERNATIVE 1 – CENTREX. The current Centrex system has been used since 1989 with essentially the same services and pricing. Centrex is a service of the telephone company depicted in the figure 1. There is a large telephone central office (CO) switch that serves all Frontier (also called Navajo Communications) customers. Each Centrex phone has its own wire to the CO switch. When a Centrex telephone calls any other phone, on Centrex in the same office, across the Navajo Nation or in the world, the call is switched by Frontier in St. Michaels.

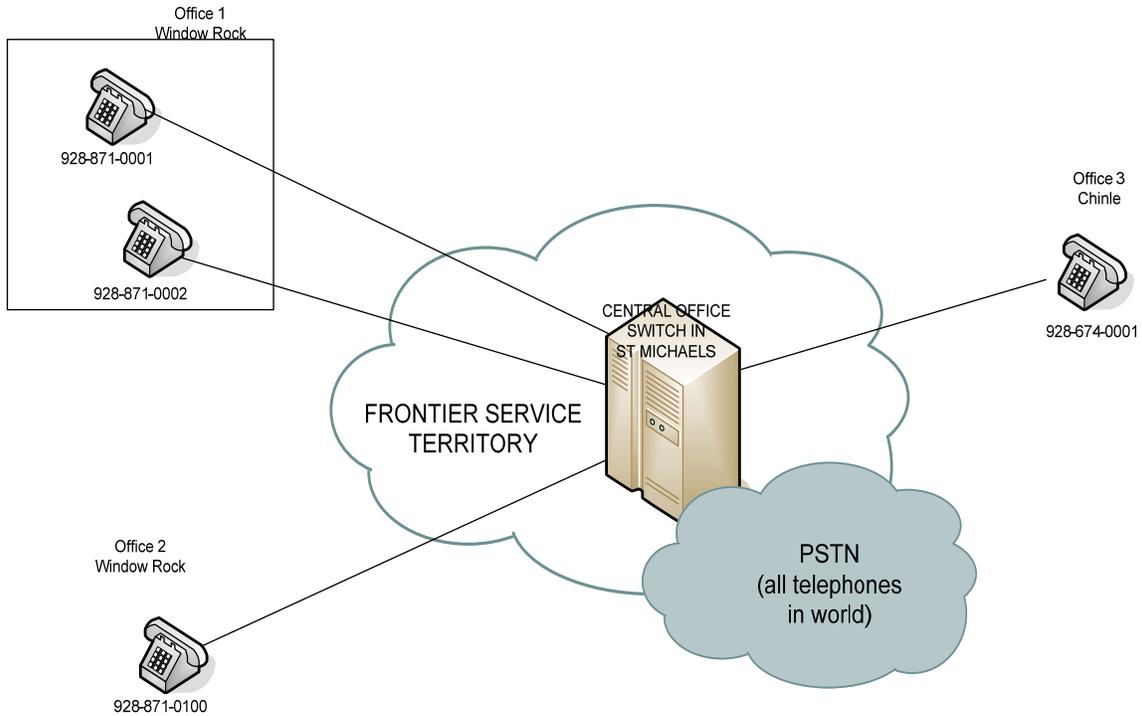


Figure 1
Centrex Architecture

The primary advantage to Centrex customers is that the telephone company owns and maintains the switch and is responsible for all costs of housing, upgrading and repairing the system. The departments do not have to have a technical staff related to Centrex since the telephone company is responsible. Centrex switching is old technology and most technology developments are appearing in VoIP systems. An extensive list of advantages and disadvantages of Centrex service is provided in section 3.2. The primary disadvantages are that Centrex is fairly costly and does not provide most telephone users the features they need (either because they can't afford them or the Centrex does not offer them).

There are two primary types of Centrex lines – basic and business set. On the average, each Centrex line includes about \$10 in federal and state charges that would not apply to VoIP. The average Centrex line including all charges is about \$34. Basic Centrex lines with no features cost about \$30 and business lines with a moderate amount of features cost about \$57. High cost, poor functionality now and lack of future capabilities are the primary reasons why Centrex are not part of the strategic direction of the Navajo Nation.

ALTERNATIVES 2 AND 3 – VoIP. Voice over Internet Protocol voice services use Internet standard protocols to digitize, compress telephone conversations, and send them in IP packets over a network. The network can be internal to the Navajo Nation but also connect to other IP networks such as provided by a long distance IP carrier or the Internet

itself. Figure 2 shows a simplified view of a VoIP network than can either be department-owned and/or involving a VoIP service provider.

In Figure 2, the network serves both data and telephone communications. It is common for the PC to connect to the VoIP telephone, which then connects to the network. PCs or telephones can individually connect as well. To make a call, the VoIP telephone communicates with the call manager to set up a call. The call manager instructs the router to connect to either a local digital phone trunk to the local telephone company, to a telephone on the Navajo Nation network which could include Internet sites. The call manager can be anywhere on the network.

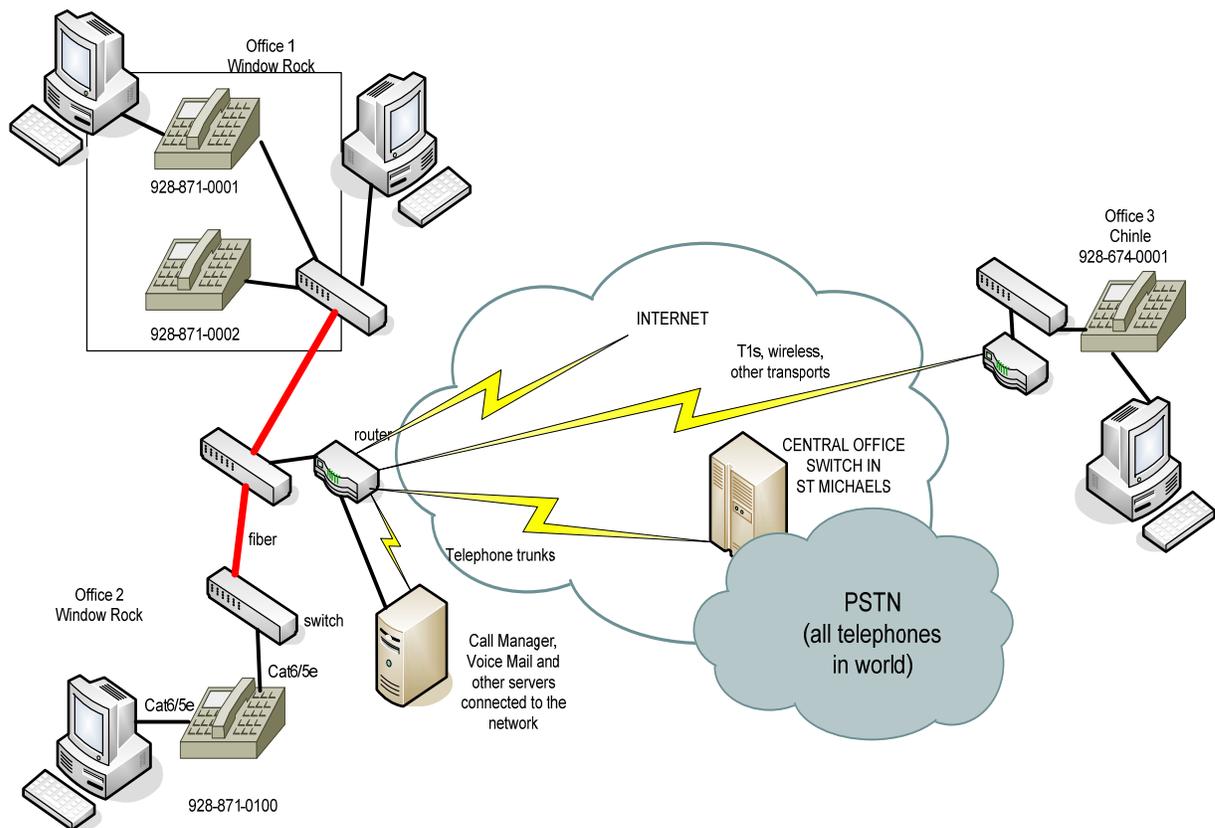


Figure 2- Generic VoIP Architecture

In Figure 2, the VoIP and data communications share the same infrastructure, although separate VLANs keep the data and VoIP packets separated. VoIP traffic is provided quality-of-service treatment to its packets to insure high-quality and reliable telephone calls. Somewhere in the network, a call manager sets up calls both within the Navajo Nation network and to telephone company services. Both VoIP alternatives, (2) department-owned and (3) service provider, share most of the advantages and disadvantages of VoIP which are detailed in section 2.0. Differences will be highlighted after the following general VoIP discussion and detailed in sections 2.1 and 2.2.

Nearly all new telephone systems for organizations being currently implemented today are VoIP. Consequently, most development of new features, such as integrating video with voice, are being developed for the VoIP telephone systems.

VoIP is dramatically more efficient than predecessor telephone systems such as Centrex or Private Branch Exchanges (customer-owned traditional telephone switch). VoIP uses the same local and wide area networks as an organization's data and internet uses. These type networks have been dramatically declining in price and increasing in capacity. VoIP itself is efficient in using much less bandwidth to transmit calls than previous voice-dedicated transmission. When there is silence in either direction of a conversation, VoIP does not use any bandwidth, which is not the case for previous methods such as Centrex.

Since VoIP requires a high-quality network that operates at faster speeds than has been available throughout and between the Navajo Nation governmental offices, NNCUD and NNDIT will pursue the implementation of VoIP as a joint delivery team. The evolution to VoIP will require the active engagement of each office that converts to VoIP. With very few exceptions, significant upgrades, probably complete replacement of the data networks will be required for most offices converting to VoIP. The upgrade to an office's network needs to be considered as not just a requirement for VoIP but as a productivity boost for using internal and Internet-based information technology.

VoIP provides a full range of services such as caller-id, voice mail, multiple line appearances, audio conferencing as part of its base price. These services can more than double the cost of a Centrex line to as much as \$70. The VoIP base price can range between \$15 and \$40 with an average price being around \$20. One factor that reduces this cost from Centrex has more than \$10 in per-line fees mandated by the Federal Communications Commission and state regulators that do not apply to VoIP systems. In order to take advantage of the extensive features, generally a more expensive telephone (\$200 to \$500) is purchased than commonly used with basic Centrex. Where Centrex has these useful features, the telephone cost is similar.

VoIP service provides many tools for departments to manage their employee's use of telephones to perform their jobs. Calls can be routed in and out of a department to minimize personal and other unproductive calling. Reports are available to supervisors to track the performance of the employees. Call distribution options are available to distribute the calling workload throughout a department. Departmental answering points receive much better tools than previously available.

Funds to pay for the various offices conversion to VoIP come from multiple sources and on varying time lines. Some capital funds to make changes to buildings such as proper wiring and wiring closets and pathways require a multi-year process. United States government appropriations fund some of the technology used in the Navajo Nation. Since different U. S. agencies provide funds for various Navajo Nation programs, there is little coordination on what is funded and when the projects can be implemented. Current expenditures on telephone systems and calling is significant but in the form of a monthly expense. The significant capital fund (one-time) requirement to upgrade the data

infrastructure to VoIP standards makes it unlikely that only current telephone funds can support upgrades alone. Periodic and significant expenditures on the information technology infrastructure is critical to allowing the infrastructure achieve the level advisable to support VoIP. For these reasons, it is probable that conversion to VoIP will be a multi-year, evolutionary process. Fortunately, it is possible to allow department-owned VoIP, service provider VoIP and Centrex to work together.

In summary, it is advisable for the Navajo Nation to upgrade its data infrastructure to current standards and leverage this new capability with Voice of Internet Protocol telephone service. Employees of the Navajo Nation will then be able to provide high quality telephone support to the calling public and allow the various departments to work together efficiently.

SECTION 2.0 VOICE OVER INTERNET PROTOCOL

Both VoIP alternatives, (2) department-owned and (3) service provider, share most of the advantages and disadvantages of VoIP. Differences will be noted after the VoIP discussion. Some of the major **advantages** of VoIP are:

- The voice communications for an office can use the same network as its data and video communications. Technicians and network management personnel in a department are familiar with operating and maintaining such a network.
- Sophisticated network diagnostic tools allow central oversight of the voice network. Experts at a central site can assist a department that is short of technical staff. Experts from outside the organization, such as in Albuquerque or San Francisco can be effective in providing support for unusual problems such as a disaster situation. Off-site support can also provide off-hour coverage when there is usually a low workload and employing a Navajo Nation staff member is not cost-justified. The technical staff can be concentrated their time when they will be the most effective.
- Telephone sets can be anywhere on the network and function in an integrated fashion with telephones at the Window Rock campus – the telephones can be at the most remote chapter house or anywhere on the Internet such as the Washington DC office. If there was a large load of calls coming to one particular office, these calls could be answered at any site on the network to provide better service. In the event of a disaster, such as a building burning down, these calls can be routed to an operational site.
- Voice communications are compressed, allowing telephone company digital circuits to carry more simultaneous conversations than traditional telephone trunking.
- When there is silence on either the sending or receiving side of a conversation, no network capacity is used – further increasing the number of simultaneous conversations.

- Telephone sets can be user-installed and moved.
- VoIP software is regularly adding new features and capabilities.

Disadvantages of VoIP are:

- Most data networks need major upgrades to support the quality of service and IP telephone power requirements.
- The network must be supported better than most data networks which are not 24x7 and highly redundant. Network repairs are the responsibility of Navajo Nation technicians or its contractors.
- Service restoral time expectations are higher with voice than many data networks.
- Skilled network technicians require extensive training and retention of skilled network technicians is difficult.
- A major capital expense is necessary, at a minimum for new telephones.
- New versions of software are frequent with additional cost and potential disruption to service.

VoIP EQUIPMENT CHOICES

The same telephones are necessary for both Department-owned and service provider VoIP. The cost ranges between \$200 for basic, single-line workstation telephones, to \$400 for full-feature, multi-line appearance workstation telephones to \$600 for a multi-line, top-of-the- IP telephone.

SECTION 2.1 DEPARTMENT-OWNED VOIP

The most common deployment of VoIP is where the organization owns its own VoIP infrastructure. Since the Navajo Nation has only purchased Cisco VoIP systems, the department-owned VoIP is discussed in Cisco terminology. Appendix A1 contains Navajo Nation-provided Cisco documentation on its recommended implementation for the Navajo Nation owned Cisco systems. The call manager, voice mail and other servers are purchased and maintained by the department. There are currently two such systems on the Navajo Nation, at the Division of Social Services (TANF program, 2 call managers) and at the Department of Information Technology (1 call manager). Social Services owns two additional call managers for its administrative division that it is currently installing. Social Services is the VoIP case study covered in section 3. The DIT system is in the process of being enhanced with a redundant call manager purchased by the Communications and Utilities. All six call managers are being implemented to work efficiently together.

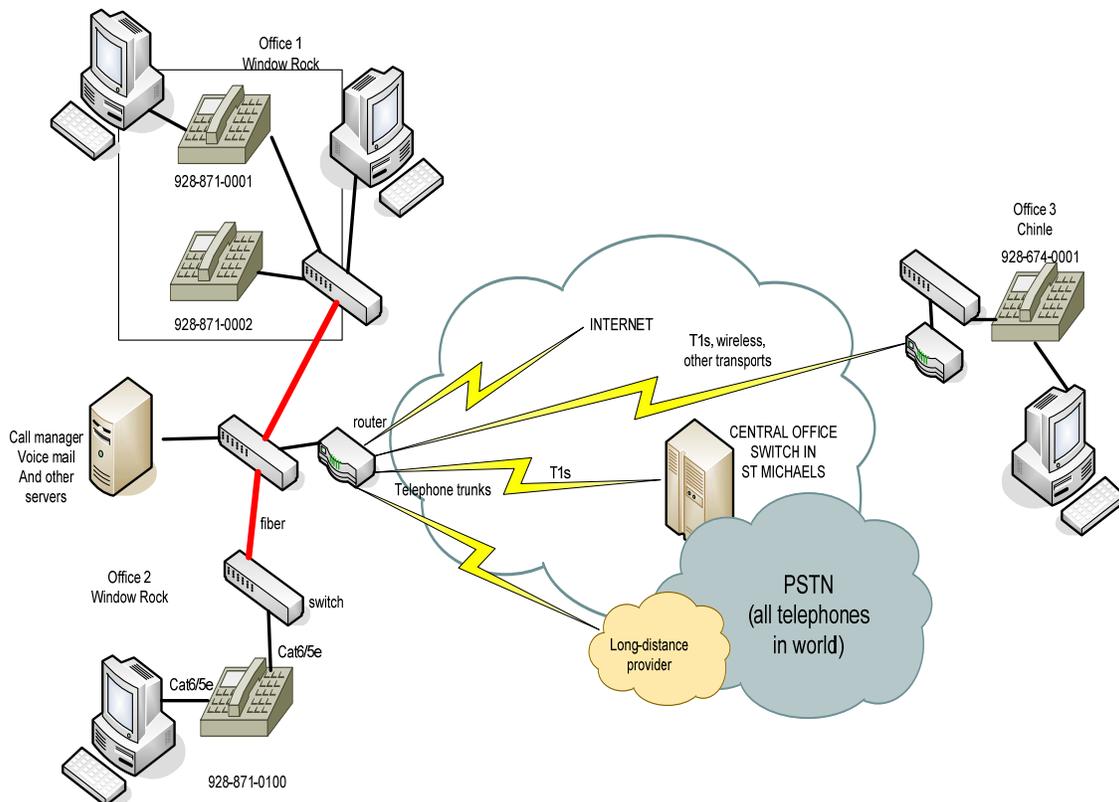


Figure 2 – Department-owned VoIP

Advantages of department-owned VoIP are:

- It has the potentially lowest cost long-term cost since it is owned,

- It can be customized specifically for the Navajo Nation since they are the only organization using it,
- Upgrades are frequently available containing new capabilities that can be purchased if desired by the Nation,
- Technology skills necessary to manage and operate the system could be developed and utilized on the Navajo,
- Funding may be available specifically for an department to purchase a system.

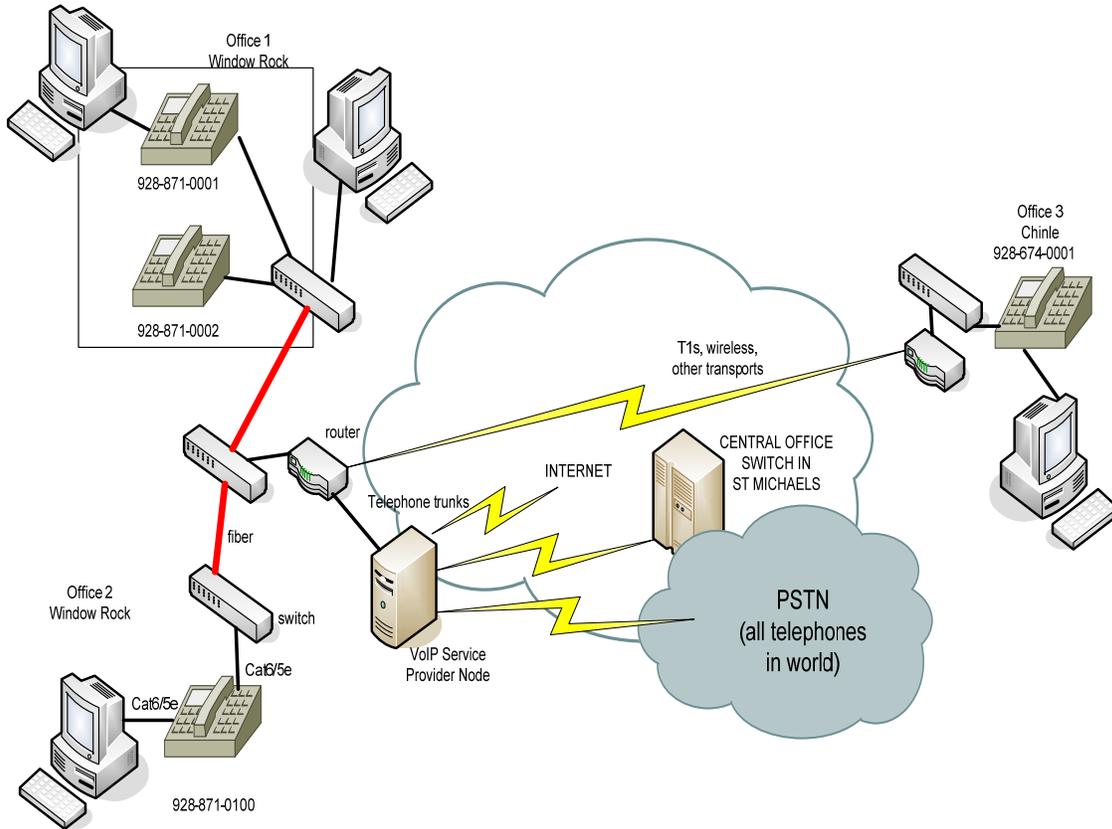
Disadvantages of department-owned VoIP are:

- Additional Navajo Nation technical and administrative staff will be necessary to manage, implement and operate the system who will need considerable costly training,
- Technical staff are difficult to obtain so training staff in-house is often necessary,
- Retention of technical staff is difficult under current pay scales,
- There is a large up-front cost,
- There is likely a long implementation time,
- If the Navajo Nation chooses self maintenance there could be significant, unexpected cost, especially in the event of a disaster,
- Software licenses must be bought and renewed for each telephone and when no longer needed this may be a stranded investment,
- Inter-operability between departments could be difficult if deployments differ,

SECTION 2.2

SERVICE PROVIDER VoIP

Heavily advertised for residential VoIP phone service, companies such as Vonage provide service provider VoIP service but this type service is inappropriate for organizations such as the Navajo Nation. There are regional and national companies that provide VoIP telephone service for small and large businesses, governments and other organizations on a turn-key basis into a network provided by the customer.



Advantages of Service Provider VoIP are:

- The Service Provider has an existing switching infrastructure that can be quickly implemented.
- The Service Provider has an experienced staff, much larger and with more expertise than a department can obtain.
- The Service Provider can locate its technical staff in an area that is advantageous to obtaining and retaining them.
-

Disadvantages of Service Provider VoIP are:

- Since the price of Service Provider service receives very little federal universal service fees, a change in policy at the FCC could dramatically raise the costs if they were treated similar to Centrex.
- There would be an on-going expense that is likely to increase after the initial contract period.
- Telephone numbers would belong to the service provider and they would not necessarily have to transfer them to the Navajo Nation as would a regulated carrier.
- Technology skills would not necessarily be developed on the Navajo Nation but provided from an off-reservation area.

SECTION 2.3

Navajo Nation Voice over Internet Protocol (VoIP) Policies

- PURPOSE:** The policy ensures that the implementation of the VoIP technology for the Navajo Nation government offices is cost effective and efficient by leveraging use of divisional networks and the Navajo Nation's interagency backbone provided by the Department of Information Technology. The policy shall cover all three Navajo Nation Branch Governments; Legislative Branch, Judicial Branch, Executive Branch; and 110 Navajo Nation Chapter Houses
- AUTHORITY:** Pursuant to Government Services Committee Resolution No. GSCAP-11-93 the purpose of the Navajo Nation Communications & Utilities Department (NNCUD) shall be to administer, manage, and plan for the communication (telephone and radio) and utility activities for the Navajo Nation (NN). VoIP is governed by this authority.
- EFFECTIVE:** Effective immediately
- BACKGROUND:** VoIP is a method of transmitting telephone calls over an Internet Protocol (IP) network. The IP network can be a single building closed network, an enterprise network such as provided by Navajo Nation Department of Information Technology, and/or the public Internet. VoIP telephone systems and VoIP from service providers are the state-of-the-art method for providing office communications.
- POLICY:** The Navajo Nation Divisions, Departments, Offices and Programs (referred to as Requester) wishing to implement VoIP technology and systems shall comply with the following policy elements:

PROCEDURES:

1. NNCUD will review and approve all VoIP systems, equipment, software, licenses and services before:
 - 1.1. Any proposals are initiated and final contract is signed;
 - 1.2. Equipment, software and licenses are purchased, leased, rented, donated or loaned;
 - 1.3. Consultants are hired;
 - 1.4. Communication circuits are ordered.
2. Requester shall complete the attached NNCUD Administrative (Attachment A) and Technical (Attachment B) Assessments that describe their current network and communication activities.

3. Requester will provide proposed system contract, costs, configurations, system specifications, and technical contact email and telephone number with proposed provider.
4. Requester must describe how the VoIP system fits in their overall network and communication plans. Any network changes required to implement VoIP should be fully documented. Any other locations that will be changing should be described.
5. Each procurement will require a new NNCUD approval even where a master contract exists.
6. Requester will specify how 9-1-1 and E9-1-1 communications will be provided.
7. A complete technical review and approval will be performed by the Department of Information Technology (NNDIT). Some of the elements considered are:
 - 7.1. Interoperable with the NNDIT central call administrator
 - 7.2. Integration and compatibility
 - 7.3. High quality connection documented to NNDIT core network
 - 7.4. Security methods are documented
 - 7.5. Quality of Service elements of the network must meet NNDIT standards
8. Must be compatible with NNCUD telephone practices:
 - 8.1. For Window Rock systems, integration with the Centrex and communication providers must be described by the Requester;
 - 8.2. Complies with NN tri-state dialing plan.
9. Requester will specify funding sources for
 - 9.1. Initial equipment, software, licenses and implementation costs;
 - 9.2. Recurring staff, maintenance, license, software and communication circuit and services.
10. Requester will provide a Cost/Benefit analysis to NNCUD that includes:
 - 10.1. Total cost of ownership (TCO) over a 5 year period of the proposed VoIP solution;
 - 10.2. Compare TCO of other methods considered such as Centrex or NNCUD's provided VoIP solution;
11. VoIP solution needs to be provided by a qualified vendor.
12. Requester must comply with Navajo Nation procurement requirements.
13. NNCUD reserves the right to audit any system at any time and in a timely manner the Requester must provide all VoIP related contracts, purchase orders, system configurations, information on communication circuits, training packages and other related items requested by NNCUD.

14. Non-compliance with this policy will be subject to Navajo Nation Personnel Policies and Procedures and will be referred to Office of Auditor General.



The
NAVAJO

JOE SHIRLEY JR.

PRESIDENT

BEN SHELLY

VICE PRESIDENT

COMMUNICATIONS & UTILITIES • P.O. Box 2928 • Window Rock, Arizona 86515 • (928) 871-7740 • Fax (928) 871-7741

March 1, 2007

MEMORANDUM

TO: Honorable Roy Laughter
Navajo Nation Council Delegate

FROM: _____
Pearl Lee, Program Manager
Communications & Utilities Department
Division of General Services

SUBJECT: **Sponsorship of NN Governmental Voice over Internet Policy (VoIP)**
SAS Document No. 19364

Pursuant to Government Services Committee Resolution No. GSCAP-11-93 the purpose of the Navajo Nation Communications & Utilities Department (NNCUD) shall be to administer, manage, and plan for the communication (telephone and radio) and utility activities for the Navajo Nation (NN). VoIP is governed by this authority.

VoIP is a method of transmitting telephone calls over an internet protocol network. The intent of the the policy is to ensure that the implementation of the VoIP technology for the Navajo Nation government offices is cost effective and efficient by leveraging use of divisional networks and the Navajo Nation's interagency backbone provided by the Department of Information Technology. The policy shall cover all three Navajo Nation Branch Governments; Legislative Branch, Judicial Branch, Executive Branch; and 110 Navajo Nation Chapter Houses

We respectfully request for your sponsorship of this policy for approval by the Government Service Committee. The Navajo Nation VoIP Team can meet with to discuss this further with you at your convenience. Please call me at directly at (928) 871-6282.

Attachment

Xc: NN VoIP Team
chronofile (rlaughtervoippolicy)



**Voice over Internet Protocol
Administrative Site Assessment (required for each site)**

Division			
Department			
Agency Location:	<input type="checkbox"/> Ft Defiance <input type="checkbox"/> Western <input type="checkbox"/> Eastern <input type="checkbox"/> Shiprock <input type="checkbox"/> Tuba City		
Site Contact:		Phone:	
E-mail			

Building

Physical Address _____ City _____ State _____

Type of building (Modular, Trailer, etc...) _____

Ownership of Building Tribal BIA Private Other

Is the building a historical building? Yes No

Does the building meet building codes? Yes No

Is the building shared by other departments? Yes No

If yes, which departments? _____

Are there other departments in close proximity of the building? Yes No

If yes which departments? _____

Is building power stable enough to handle equipment? Yes No

Floor plan provided? Yes No

Funding

Funding available? Yes No

Type of funding? _____

Contract Admin and or Accountant Contact: _____ E-mail: _____ Phone: _____

Staffing

Organizational Chart Provided? Yes No

Total staff in building: _____

IT staff in building? Yes No If yes how many? _____

IT Names	Title	Phone Number	E-mail
----------	-------	--------------	--------

Internet Service Provider

Internet Service Provider: (Frontier, DIT, etc.): _____

How many T-1, DSL, etc. accounts do you have? _____

Please provide a list of accounts and which offices they belong to.

Are your payments up to date? Yes No

Do you require a balance and terms of service check? Yes No

Telephony

Telephone provider: _____

Are your payments up to date? Yes No

Please provide a list of accounts and which offices they belong to.

Are your payments up to date? Yes No

Do you require a balance and terms of service check? Yes No

Total number of phones lines coming into building: _____

Total number of phone lines for department: _____

Number of phone lines with long distance dialing _____

Total number of toll free lines _____

Total number of central call centers (receptionist, 'catch-all extensions') _____

Total number of fax lines: _____

Total number of conference bridges: _____

Listing of phone numbers provided?

Yes No

Please construct a table for each phone line and line type as such:

Outside Line	Internal Extension	Type of line	No. of users	General listing of existing services for each line	General listing of anticipated IPT services for each line
Example A: 928-871-2000	2000	Fax	15	8-5 long distance	24x7 long distance
Example B: 928-871-2001	2001	Voice	2	voicemail, caller id, 8-5 long distance	voicemail, caller id, long distance
Example C: 800-871-2563	2563	Toll Free	>100	receiving calls only to automated system for automated routing	receiving calls only to automated system for automated routing



**Voice over Internet Protocol
Technical Site Assessment (required for each site)**

Division:			
Department:			
Agency Location:	<input type="checkbox"/> Ft Defiance <input type="checkbox"/> Western <input type="checkbox"/> Eastern <input type="checkbox"/> Shiprock <input type="checkbox"/> Tuba City		
Site Contact:		Phone:	
E-mail:			

Computers

Total computers in building _____

No. of Workstations: _____ No. of Laptop/Notebooks: _____

Total number of Operating Systems _____ 98 _____ 2000 _____ XP

Total number of servers _____

Server Name	Server Type (file, e-mail, domain controller, etc.)	Server OS

Does each computer/server have a UPS Yes No

Network

Are all the computers networked? Yes No

Type of cabling used (Cat 5, Cat 5e, Cat 6) _____

Number of hubs _____

Number of switches _____

Number of routers _____

Other Network devices? _____

Network equipment list provided? Yes No

Does the network equipment have a UPS scheme? Yes No

Network Topology provided? Yes No

Network Configuration diagram provided? Yes No

IP address scheme, range list provided? Yes No

Internet Connectivity? Yes No

If yes, what type of connectivity? Dial-Up DSL Other _____

Internet Service Provider: (Frontier, DIT, etc.): _____

Closest known T1 connection: _____

Comment [tb1]: Are these the same thing?

Telephony

Telephone provider: _____

Total number of phones lines coming into building: _____

Total number of phone lines for department: _____

Number of phone lines with long distance dialing _____

Total number of toll free lines _____

Total number of central call centers (receptionist, 'catch-all extensions') _____

Total number of fax lines: _____

Total number of conference bridges: _____

Listing of phone numbers provided? Yes No

Please construct a table for each phone line and line type as such:

Outside Line	Internal Extension	Type of line	No. of users	General listing of existing services for each line	General listing of anticipated IPT services for each line
Example A: 928-871-2000	2000	Fax	15	8-5 long distance	24x7 long distance
Example B: 928-871-2001	2001	Voice	2	voicemail, caller id, 8-5 long distance	voicemail, caller id, long distance
Example C: 800-871-2563	2563	Toll Free	>100	receiving calls only to automated system for automated routing	receiving calls only to automated system for automated routing

SECTION 2.4 DIALING PLAN

A dialing plan is a set of identifications for network addressable elements (e.g. telephones, voice mail boxes, call processors) and procedures for handing dialed digits. Compromises result from considering these factors:

- The public switched telephone network (PSTN) numbers available,
- Number of telephones and functions to be ultimately served,
- Sites to be served,
- Regions to be served,
- Integration of several telephone systems,
- Avoiding conflicts between external and internal telephone numbers,
- Network capabilities, especially Quality of Service and bandwidth availability.

Currently, most telephones in the Navajo Nation are Centrex stations served by Frontier (Navajo Communications Company). Each of these telephones has a PSTN telephone number. The first operational Voice over Internet Protocol (VoIP) phone system has been installed in the Division of Social Services in the TANF department. The administrative division will soon add another VoIP system. The Social Services' systems differ from Centrex in that there are very few PSTN numbers involved – most calls are routed to answering points, who then transfer calls to internal extensions. It is possible other implementations of VoIP could continue to have many Direct Inward Dialing (DID) numbers. Since the current VoIP systems are Cisco, the Cisco dial plan procedures are the basis of the Navajo Nation plan. This document addresses the key issue of a numbering plan.

Currently Frontier has reserved large blocks of telephone numbers for the Navajo Nation. If the implementation of VoIP minimizes the need for PSTN telephone numbers, Frontier would likely reuse PSTN numbers for other uses such as the growing use of cell phones. It is likely, as in the case of Social Services, current numbers could be maintained. These could include main office numbers (referred to below as main numbers) that are published in directories, on a web site, and in departmental correspondence to constituents. The current numbers retained could also include individual private numbers that are either published in directories and other sources but could also include unpublished numbers that have caller-id delivery blocked.

There are several likely options to consider:

Option 1 – NEW BLOCK OF NUMBERS FOR VoIP IMPLEMENTATION.

From a VoIP perspective, this is the least complicated. A set of new PSTN numbers would be obtained, probably from Frontier. It is possible, but not likely, to also get them from a Competitive Local Exchange Carrier (CLEC). The CLEC might be considered if they were willing to deliver service on Primary Rate Interface (PRI) basis or an IP basis or they had a far superior price for PSTN service. Frontier does not offer PRI and its prices are high but there is currently no active CLEC competition. PRI is the preferred

method for VoIP systems to connect to the PSTN. The VoIP service provider being considered in the pending request for proposals would likely be the vehicle for obtaining a new block of numbers. There is some risk Frontier would not allow current main numbers to be maintained if the Centrex block is largely discontinued.

The largest potential impact would be for those VoIP stations having DID numbers. They would likely need to change their PSTN number since the Centrex block will likely be eliminated. Frontier would have adverse affects for keeping a relatively few numbers dispersed throughout the current blocks of numbers assigned to the Navajo Nation.

VoIP implementation is expected to take a long period of time since the data local area networks and the government campus infrastructure needs drastic upgrades before VoIP can begin. Therefore, obtaining a large block of VoIP DID numbers is therefore not advisable.

Option 2 – RE-USE CURRENT PSTN NUMBERS FOR ALL VoIP USE.

This option is that to the greatest extent possible, current PSTN numbers would be re-used. Since implementation of VoIP is over a long period of time and a substantial number of Centrex lines are not converted to VoIP, maintaining current Centrex numbers should not be a problem.

However, this method would preclude a VoIP-optimized dialing plan. Numbers for a department are spread throughout the current Centrex block. VoIP would be assigned some of these unused numbers or more likely, ones currently in use by a department would be a hot cut-over at the time of conversion to VoIP. The VoIP systems would have to have each number registered that is VoIP instead of a range of numbers. This is only a large issue if large numbers of DIDs are used on the VoIP system. The dialing plan meetings concluded that this is not likely to be the case. The prediction was that very few DIDs would be used and there would primarily be DIDs coming to answering points.

Internal numbers will use ranges not in use by the PSTN so that at least those can be efficiently routed by VoIP systems.

INTERNAL NUMBERING STRUCTURE

5th DIGIT.

The dialing plan committee discussed a 5 digit internal regional numbering system where the 5th digit is a region. The 5th digits “0” and “9” will not be used since “0” will be reserved to reach the operator and “9” is the code to make an outside call. The regions would be Window Rock and the 5 Agency areas. Since Window Rock numbers are primarily in the 928-871 exchange, the digit “1” would be assigned to Window Rock telephones. Similarly for the agency digit assignments, the largest number of PSTN

assignments for the 5th digit will dictate which number is assigned to which Agency. **Any PSTN numbers in conflict with the following assignments will not be used for the internal number plan and will be unavailable for internal use. Where there is no conflict with the PSTN number, the internal number may be also used for an internal number.**

5th DIGIT ASSIGNMENTS FOR INTERNAL NUMBERS

- 0 – RESERVED FOR OPERATOR
- 1 – WINDOW ROCK (PSTN main number 927-871 6000-7999)
- 2 – VOICE MAIL AND OTHER APPLICATIONS
- 3 – WESTERN AGENCY (TUBA CITY) (PSTN 928-283 3000-3499)
- 4 – CHINLE AGENCY (PSTN 928-674 2000-2399)
- 5 – RESERVED FOR FUTURE USE
- 6 – EASTERN AGENCY (CROWNPOINT) (PSTN main number 505-786 2000-2399)
- 7 – FT DEFIANCE AGENCY (PSTN 928-729 4000-4599 Can't use "9")
- 8 – SHIPROCK AGENCY (PSTN 505-368 1000-1499)
- 9 – RESERVED FOR OUTSIDE LINE REQUEST

4th DIGIT

Since there are 13 Divisions and Branches, each cannot be assigned its own digit. It is possible to assign the largest ones a digit. The totals for extensions and special lines such as fax by Division and Branch are:

Department of Dine' Education	466
Division of Community Development	477
Division of Economic Development	148
Division of Environmental Protection Agency	126
Division of General Services	280
Division of Health	872
Division of Human Resources	470
Division of Natural Resources	549
Division of Public Safety	545
Division of Social Services	635
Executive Offices	460
Judicial Branch	182
Legislative Branch	170
TOTAL	5380

Since each division cannot have its own 4th digit, the 4 digit ranges, which support a total of 10,000 unique numbers, will be assigned by ranges. A 50% growth from current extension volumes will be used. Current Window Rock Extension numbers in the main exchange (6000-7999) will be reserved. The 810 Window Rock numbers will not be reserved since they will have to change their 5th digit, which is a "0" and cannot be used in an extension (reserved for operator).

The internal 4 digit assignments are:

Division	Number Ranges	Total current #
Department of Dine' Education	0000-0699	466
Division of Community Development	0700-1399	477
Division of Economic Development	1400-1649	148
Division of Environmental Protection Agency	1650-1849	126
Division of General Services	1850-2299	280
Division of Health	2300-3599	872
Division of Human Resources	3600-4249	426
Division of Veteran Affairs	4250-4299	42
Division of Natural Resources	4300-5099	549
Division of Public Safety	5100-5899	545
Reserved	5900-5999	
Current Window Rock Extensions on main exchange	6000-7999	2000
Division of Social Services	8000-8899	635
Executive Offices	8900-9499	460
Judicial Branch	9500-9749	182
Legislative Branch	9750-9999	170
Navajo Way/Navajo Times	Keep current numbers	33
	Total Window Rock Numbers	5411

These quantities account for a 50% growth, rounded to the nearest 50. Since the current Window Rock main exchange 5 digits (1-6000 to 1-7999) are reserved for internal numbers, the PSTN and internal number can be the same.

2.5 VoIP CASE STUDY

Social Services is to provide the technical and administrative assessments as the basis of the case study.

Some issues for Social Services in deploying a VoIP systems have been:

Research into VoIP began in 2002 with the procurement process begun in 2004 and implementation in 2006. VoIP was practical when the LAN and WAN was upgraded with appropriate wiring, routers and T1 lines. 2001 wiring standard was Cat 5e with current wiring being Cat 6. Power over Ethernet and internal wireless networking was part the network implementation. Cisco 3750 switches has been the standard deployment starting in 2003.

There are 500 VoIP telephones on the ultimate Social Service system. 300 of these are TANF, 80 initial administrative telephones are being implemented with 200 being the eventual size of administrative telephones. Six T1s are needed to support VoIP.

Allocating cost is an issue and sometimes memos of agreement are necessary to allocate cost among the 13 different programs that have a variety of federal, state and tribal funding. There is a key relationship with the Division of Health, especially on child issues. There has been progress with U. S. funding in promoting collaboration and sharing. New contracts will promote allocation and sharing among programs and the accounting necessary is being developed.

I. T. projects are affected by budget cycles for different sources of funds. BIA operates on a calendar year, state programs operate on a July-June fiscal year and the federal calendar year is October to September. State funds are by contract and can't be cut mid-year by the state legislature. The implementation of technology is the most predictable part of the process.

HIPAA, the health insurance portability and accountability act, is a driver on network issues. There are strict privacy and security requirements, resulting in the need for a Virtual Private Network controlled by Social Services.

The Division of Social Services has no information technology (I. T.) budget. The practice has been to have a list of items needed which are funded at the end of a fiscal year when some funds may become available. It is typical for projects to have a 15% overhead allocation of which most goes to social and case workers, with very little for I. T. expense and investment.

The central Division I. T. administrator and assistant are funded by 3 or 4 main programs on an allocation basis. I. T. position classifications are limited. The hiring process takes six months and the low salaries do not attract qualified candidates. The personnel department has not responded to a qualification and market survey. The Division is

spread across multiple buildings with one technician per agency and in Window Rock, for a total of six technicians. Turnover is a serious issue.

Working in Bureau of Indian Affairs' buildings is complicated and right of way for wiring and electrical work needed for I. T. projects makes it unrealistic to implement some infrastructure. Bringing in own wide area network connections is also problematic. These restrictions have not allowed some Social Service offices to be online and using VoIP is impractical.

The Temporary Assistance for Needy Families (TANF) program has three of its own technicians. The selection of the first VoIP system selection was done by TANF, which selected MSE as its vendor. Procurement has used General Services Administration (GSA) contract and pricing. Section 164 review process is used for projects over \$50,000. The project was delayed several times by issues such as the FMIS payment system and payments from a department.

TANF reduced its use of telephone company Direct Inward Dial numbers from 120 with its key system to 15 with VoIP. The TANF initial implementation was 150 telephones based in Shiprock. Other sites are to be connected by T1s. Calls come to answering point and are transferred to internal numbers. Outgoing calls are routed and logged by the same answering points.

SECTION 3.1 CENTREX AS A VOICE CHOICE

ALTERNATIVE 1 – CENTREX. The current Centrex system has been used since 1989 with essentially the same services and pricing. Centrex is a service of the telephone company depicted in the figure 1. There is a large telephone central office (CO) switch that serves all Frontier customers, except Centrex users are afforded a price break from individual business lines that cost about \$70 a month and have more features. Each Centrex phone has its own wire to the CO switch as does individual business and residential lines. When a Centrex telephone calls any other phone, on Centrex in the same office, across the Navajo Nation or in the world, the call is switched by Frontier in St. Michaels.

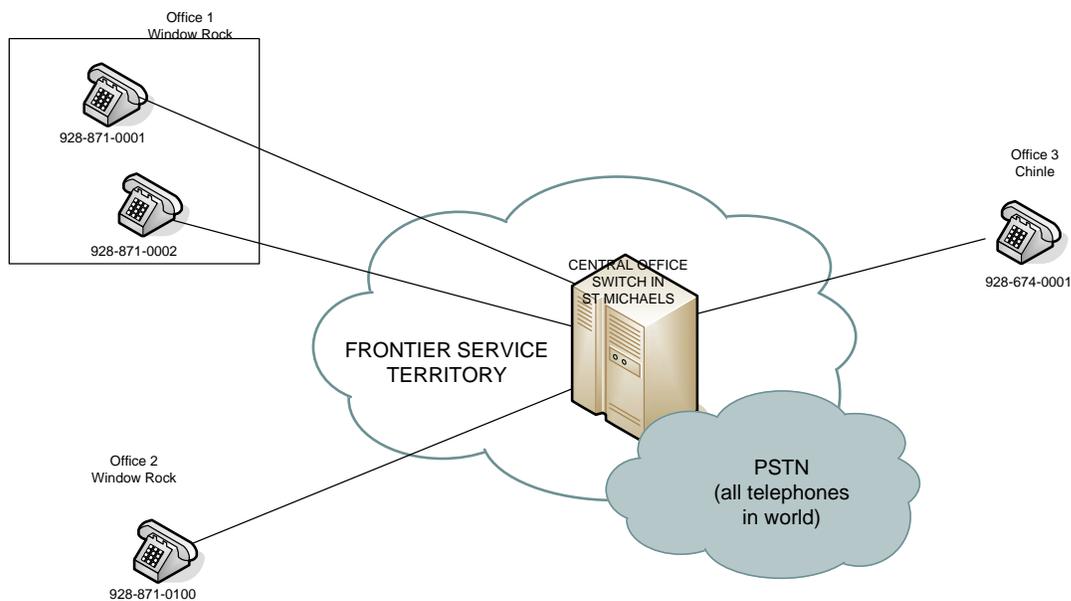


Figure 1
Centrex Architecture

Centrex has **advantages** compared to department-owned systems:

- The switch is at the telephone company central office and there is no switching equipment to be maintained by the Navajo Nation.
- The switching equipment is the same as the public switched telephone network and therefore is extremely reliable with redundancy and generator power.
- Major repairs and most minor repairs are the responsibility of the telephone company and performed on a 24x7 basis.
- Software changes and software licenses are the responsibility of the telephone company.
- The system can serve most of the Navajo Nation,
- Calls can be transferred between any department phones or other department phones as well.

- Departments can add and delete telephones as needed without a capital expense for switching -- only telephones are needed.
- E9-1-1 interfaces are well understood.
-

Centrex has **disadvantages**:

- Monthly rates are fairly expensive and highly taxed,
- Basic features useful to every worker are very expensive (e.g. voice mail-\$3.95/mo, caller-id-\$7.95/mo),
- More advanced features such as multiple line sets, multi-party conferencing, automated attendant and automatic call distribution are either expensive or not available,
- Moving telephones involves an order to the telephone company which incurs a charge and takes about a week to accomplish,
- Centrex does not have the proper software (PRI) to integrate with the department-owned systems that are needed for some sophisticated uses,
- The local telephone company is dependent on a remote corporate office to approve and fund changes to the switching and transmission systems which is a lengthy process at a minimum or service is not made available (e.g. PRI),
- Centrex is based on old technology and little if any new development is being done by manufacturers.

High cost, poor functionality now and lack of future capabilities are the primary reasons why Centrex will not be part of the strategic direction of the Navajo Nation.

4.0 NETWORK READINESS

The local area networks (LAN), which are necessary to support VoIP, are not at a high standard. Generally, the buildings need to be rewired with Category 6 UTP wiring, with proper patch panels, cable pathways and terminated into modern switches that support power over Ethernet (POE). Some buildings have some Category 5 or 5e wiring, which will work for VoIP but some lengths are too long to meet standards and the wiring work and patch panels has been substandard.

The fiber backbone between the main Window Rock campus buildings is a good start to a robust local area network that is appropriate for VoIP. The buildings that are connected to the fiber, can operate in a secure and high-bandwidth method to VoIP servers and gateways to the outside public switched telephone network, those buildings across the Navajo Nation connected to the wide area network and to the internet. The Window Rock campus is lacking redundant paths which would overcome a fiber cut. Fortunately, the DIT technical staff has the capability to splice fiber so this lack of a ring is not a fatal flaw but should eventually be upgraded to a ring architecture.

The Navajo Nation wide area network connections provided by AT&T are state-of-the-art MPLS-based high-speed connections.

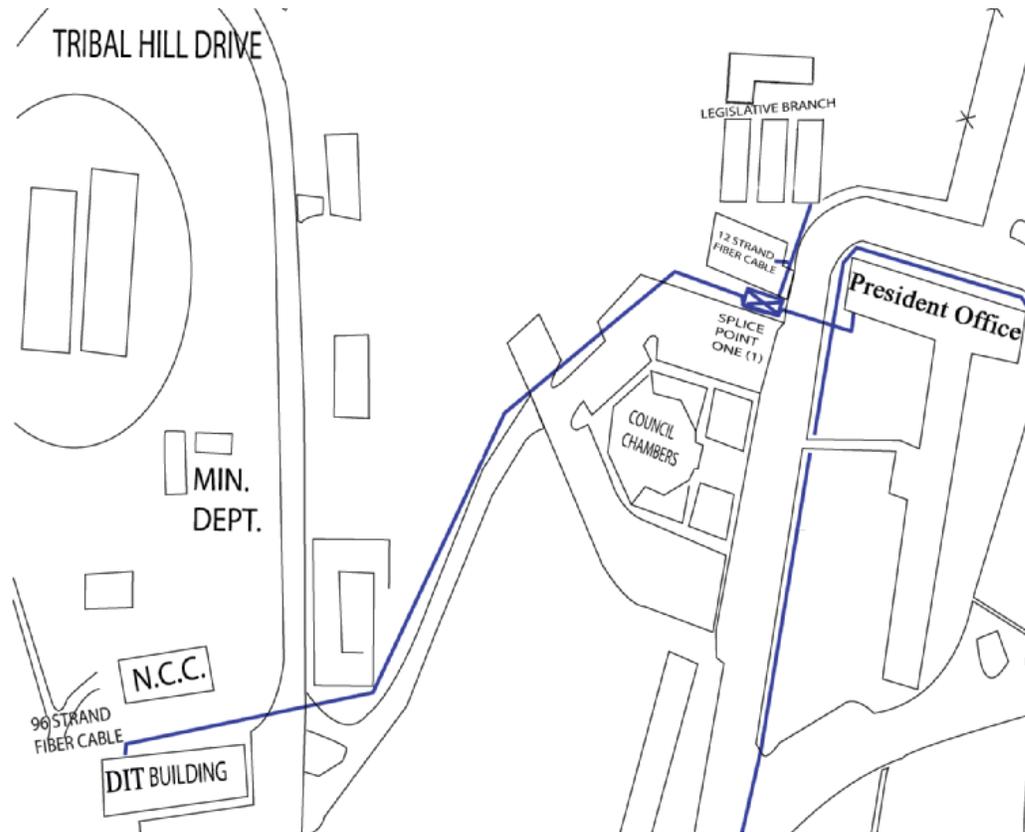
4.1 BACKBONE AND BUILDING STATUS

Local area networks are very high-speed (typically 100 or 1,000 Mbps) computer networks that connect computers within a building or a group of buildings. Communication within the LAN is generally full-function. Protections and services to connect to the outside are through routers and firewalls.

Most buildings and the offices in the buildings need significant work to meet modern standards for LANs. For example, the Education building has one main distribution frame (MDF) room to terminate wiring. This room is environmentally and cosmetically superior to most communication rooms but the distances to many of the building workstations far exceed the 300' standard. This building is connected to the campus fiber and could be brought up to standard by creating appropriate intermediate distribution frames (IDF).

Following are examples of current wiring and networking equipment:

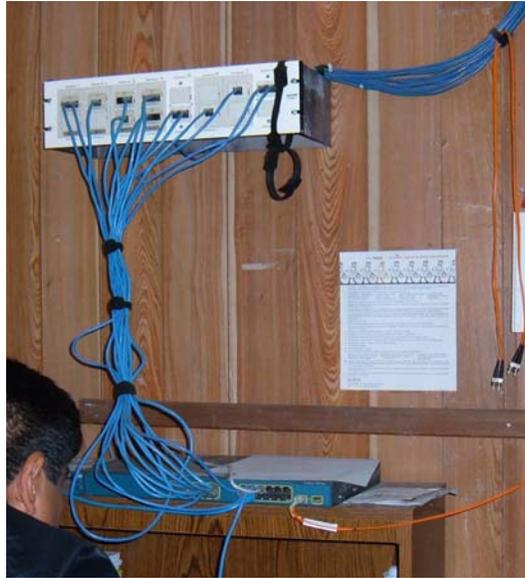
LEGISLATIVE CONNECTIVITY



The Council Chambers network connections are in a restroom with minimal infrastructure installed. There are conduits available to install more infrastructure although minimal cabinet space is available. Wireless is the main connectivity. A Cisco 3560 switch is used with no POE.



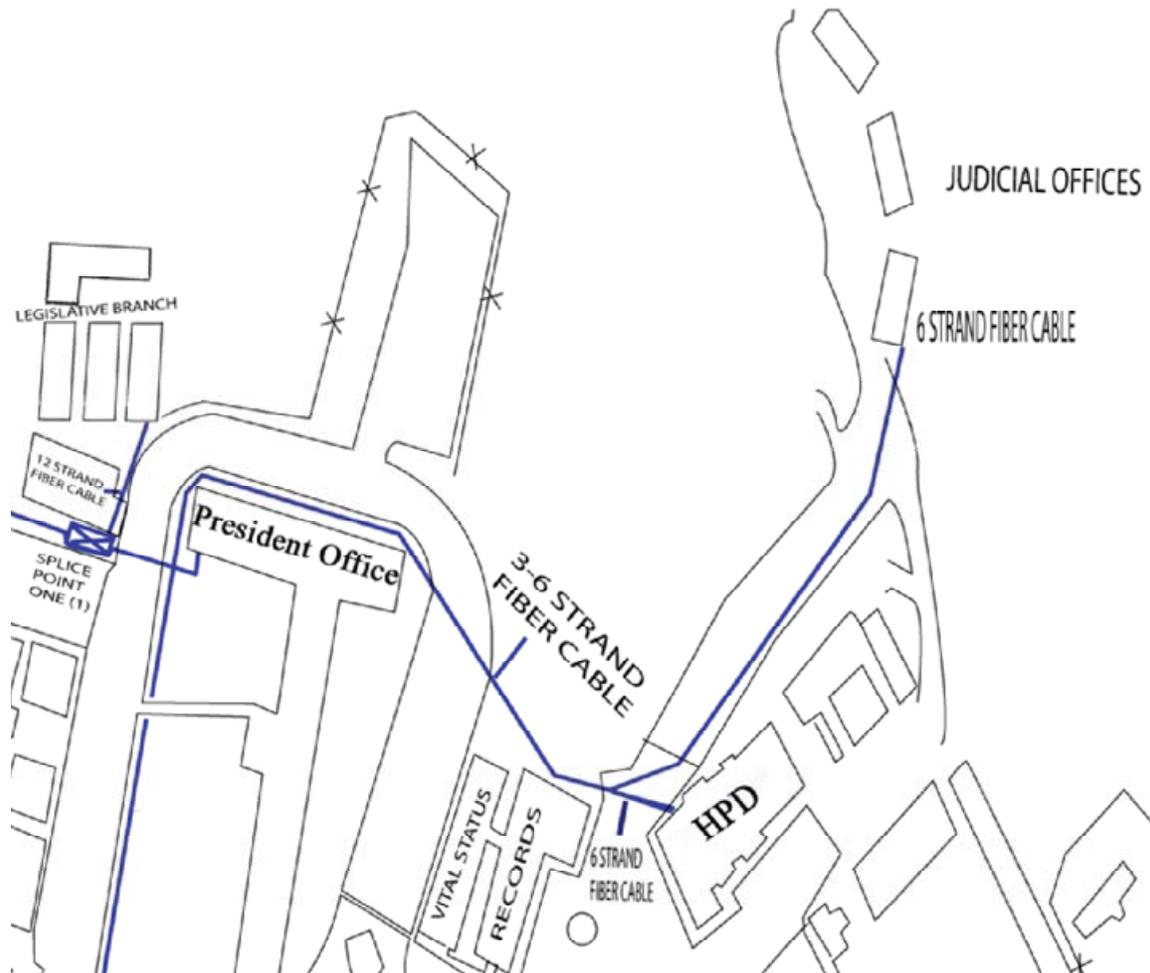
The three legislative buildings have Cisco 3750 switches with POE and wiring infrastructure as follows:



Building 3 is to be replaced.

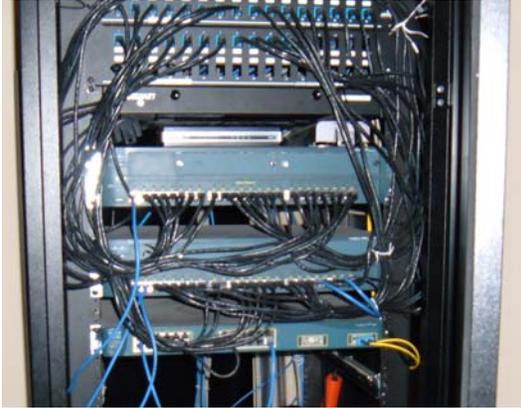
JUDICIAL OFFICES

The judicial offices have a 24 port Cisco 3550. Wiring is not up to standard, pictures were unavailable. The fiber connects as follows:



HISTORIC PRESERVATION

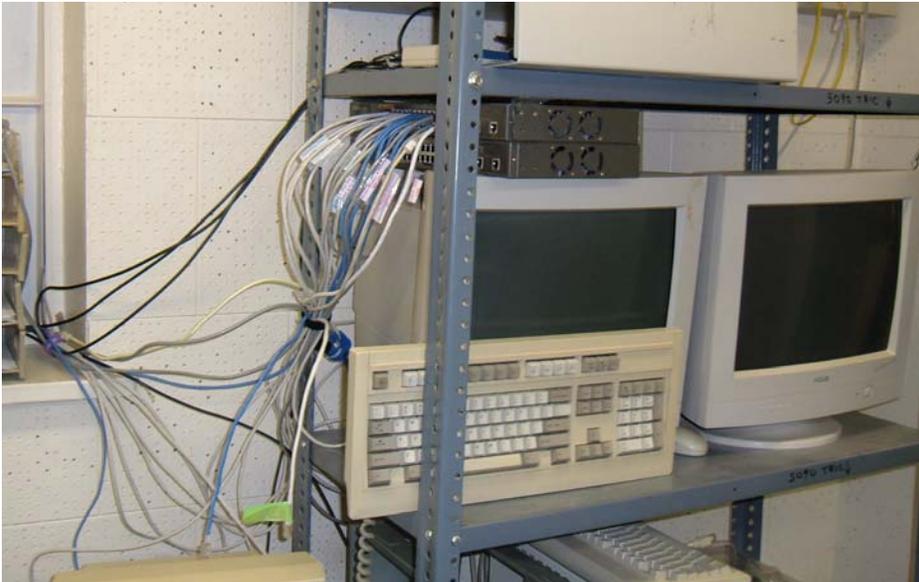
The fiber connects as shown above. Has a Cisco 3550 switch that connects to DIT and a 2900 and 2900XL with 24 ports.

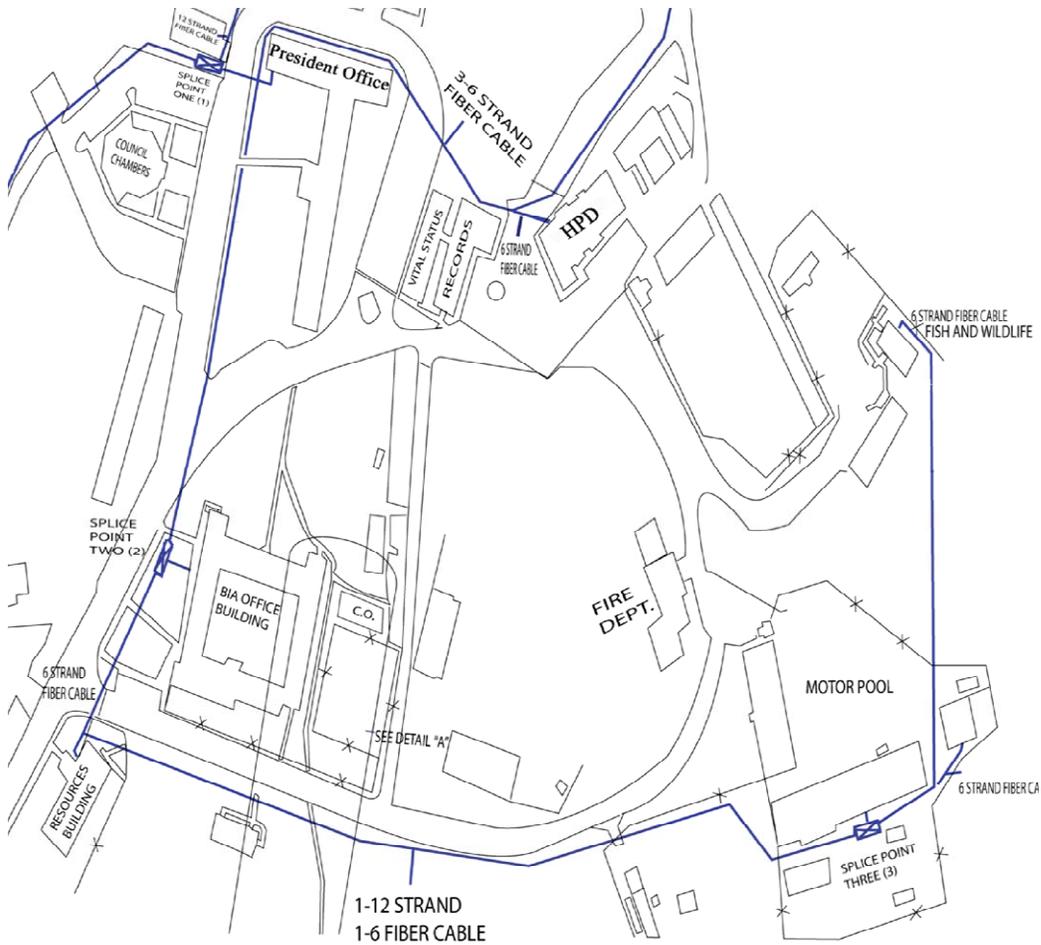


RECORDS MANAGEMENT

Has a Cisco 3550 switch connected to DIT with 24 ports and a Dlink internal switch.

Two buildings are connected by internal fiber and the public defender is connected by copper and has a 3Com switch.





PROSECUTORS OFFICE

Cisco 3550 24 port switch with a 3500XL which is not used. Have ordered a POE capable switch. The wiring cabinet cannot be mounted and is sitting on the floor awaiting historic permission to wall mount it. There is a T1 to offices across the street. Have 42 employees in both buildings. Have wireless in conference room.



MINERALS

Us DSL, not connected to DIT fiber. Use wireless to serve offices in trailer. 3524 switch.





This fiber marker is typical of the fiber route. It is between Education and Admin 1.



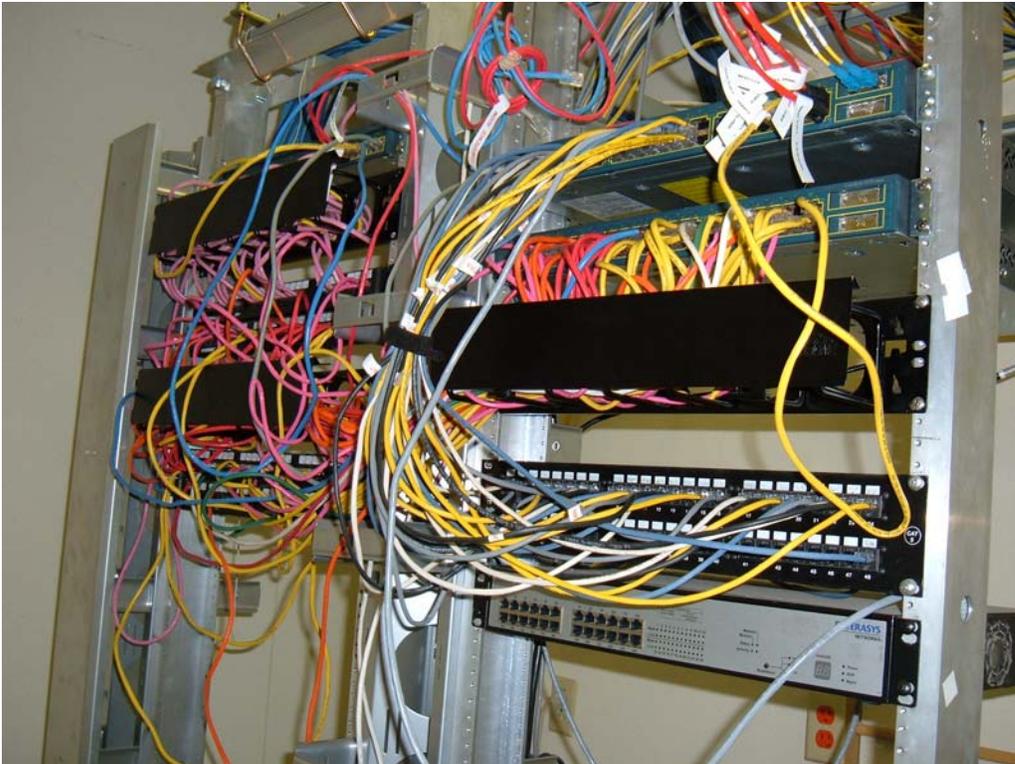
ADMIN 1

FMIS is using Catalyst 4006 with 5 blades of 48 ports each. They also have a 3550.





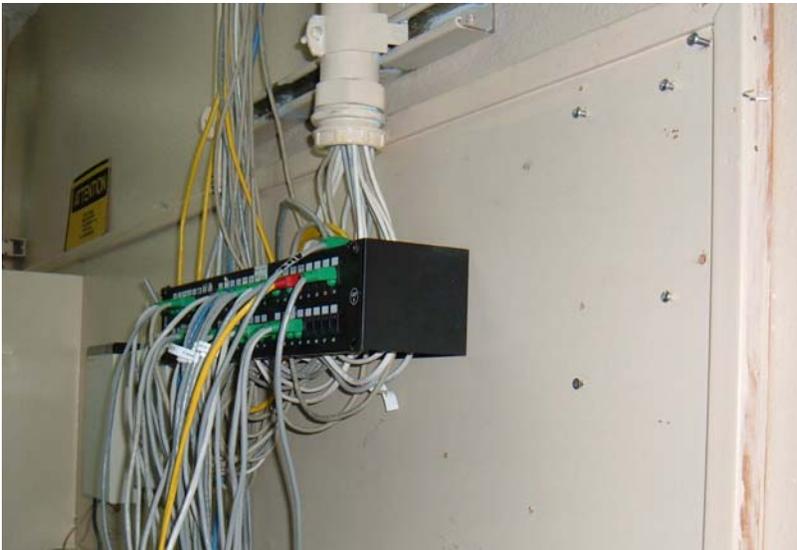
ADMIN 2

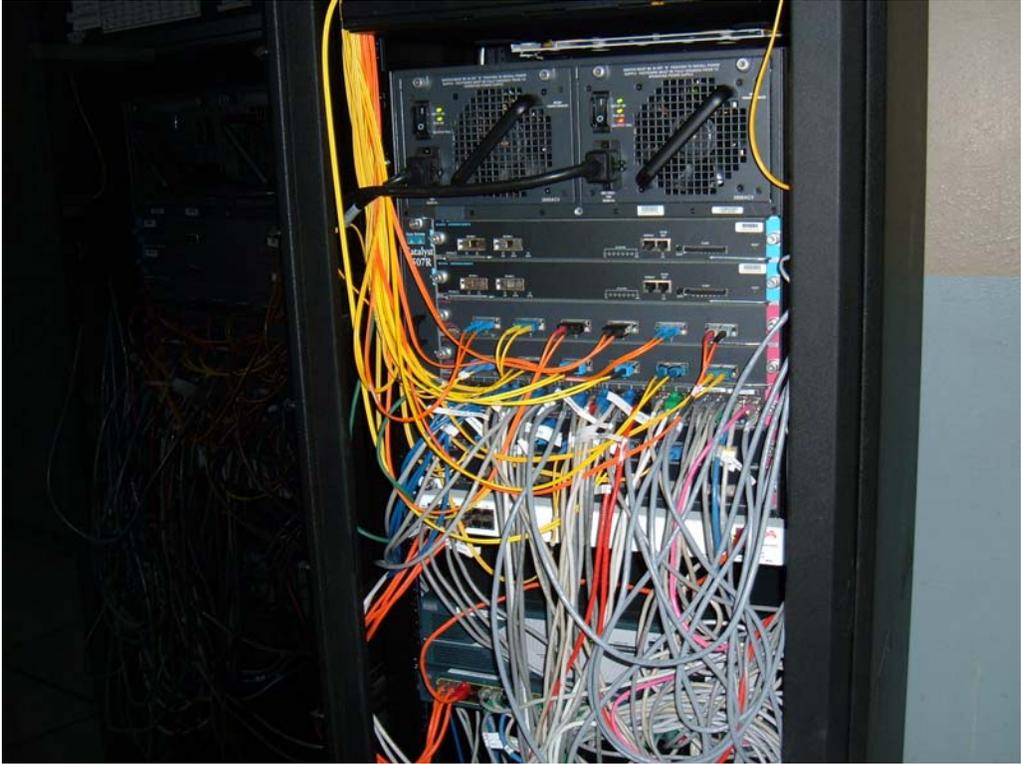


COMMUNICATIONS AND UTILITIES

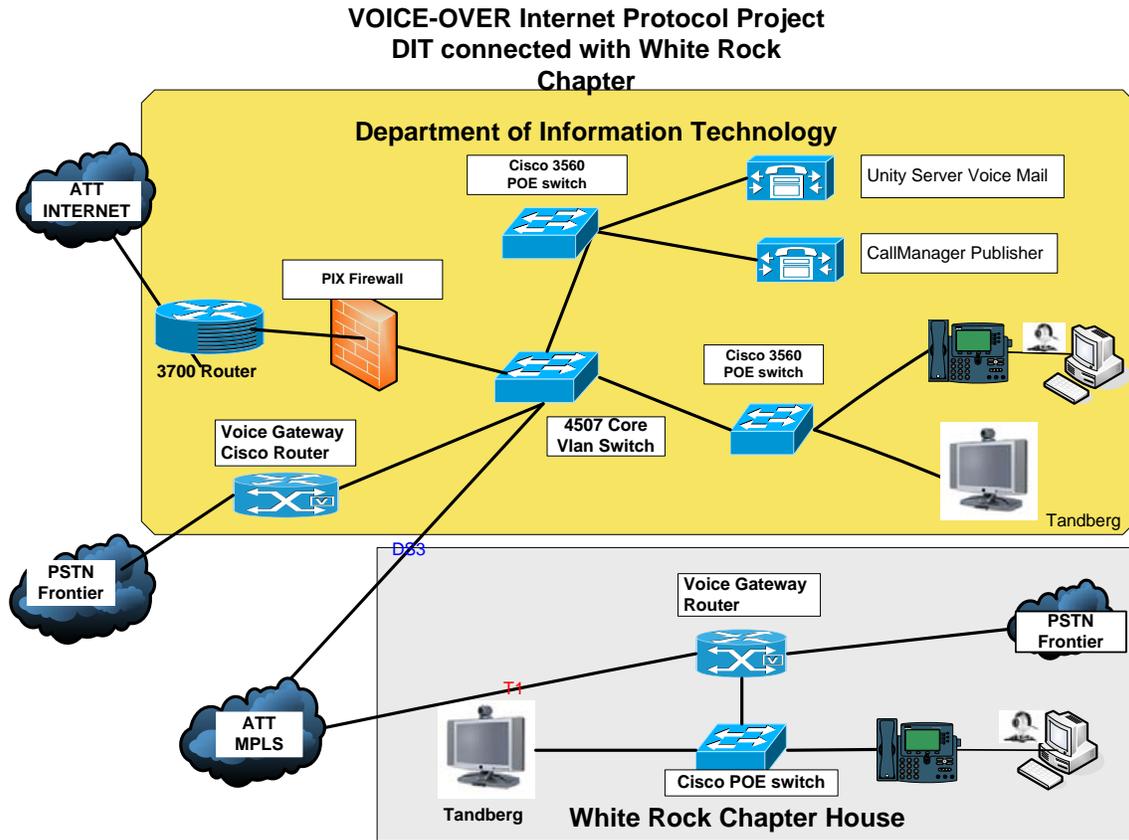


INFORMATION TECHNOLOGY





4.2 NNDIT VoIP INFRASTRUCTURE



Department of Information Technology's VoIP equipment. The remote White Rock Chapter House was the first one to get connected to the VoIP infrastructure. Other chapters will have the same connectivity with a T1 1.5mbps bandwidth.

DIT's central core switch that handle the VoIP traffic is the CISCO Call Manager. 7800 series.



4.6 TRAINING AND SUPPORT

Training is included the VoIP RFP. Local training is also available from certified training courses for technical personnel. Train the trainer will be implemented.

Significant IT Strategic Accomplishments

Department of Information Technology 2004 -2005

- Navajo Nation Information Technology Summit 2004. Much of the accomplishments for calendar year 2004 derived from this event.
- Installed and configured FAT PIPE technology and other components required to achieve a redundant environment for the DIT computer room, uptime for the system is now 99.9%. This also increases uptime for all NN Programs that use the network infrastructure. www.fatpipe.com.
- Refinement of the Navajo Nation IT Roadmap and IT policies.
- Upgraded the Heating Ventilation and Air Conditioning in the DIT computer room. This allows DIT to house more servers in a safe, secure environment. The floor in the computer room was also revamped to accommodate the expected growth of NN IT infrastructure.
- The Workman's Compensation Program has already located a SQL server at DIT.
- Refine and enhance the DIT three year strategic plan.
- Reroute, install and configure the wireless network from Admin I to the Civic Center with high bandwidth connectivity. This allows more utilization of NN owned telecommunications infrastructure, cutting down the cost of monthly charges being paid to external vendors.
- Installed high-speed T-1 connectivity for the Department of Child Enforcement. These lines go out to the agencies and have a connection to the Arizona Child Enforcement.
- Upgrade all agency connectivity links to T-1 speed.
- Installed T-1 connectivity to Dilkon PD.
- Worked with Legislative to configure and implement a fiber network that goes from the east Navajo Nation campus to DIT.
- Ongoing project with the Quad-State Broadband initiative. The ultimate goal is to establish connectivity that spans the entire Navajo reservation and have multiple links to the external global communications infrastructure.
- Help convert the legacy FRS system to the new FMIS system. Provide one FTE at a 100% support for FMIS.

- DIT has a computer lab that will accommodate up to 12 people for training in IT oriented trainings.
- Workers Compensation/Risk Management/Safety Program – Set up the Department of Information Technology conference room for Claims software training that was held by David Corps. The setup consisted of installing and configuring four laptops with Windows XP and Claims Software, set up of a network printer, and network connectivity. The training was successfully completed.
- Revamped the network infrastructure at the offices of Workers Compensation/Risk Management/Safety Programs. All existing cables and hubs were removed and all LAN lines were replaced with category 5e cables. These cables were rerouted to the Administration Building I second floor wiring closet. A patch panel was installed and 25 LAN lines were punched down, 21 of the 25 cable lines were terminated with category 5e line terminators. 25 half-foot patch cables were crimped for connecting the patch panel to the Enterasys switch. Once this was completed, all cable lines were tested for failure free connectivity and installation of installation of the David Corps RenProd Client Software was done on all their systems.
- For added security measures, 4 surveillance cameras were installed in the DIT building. NetDvr Surveillance software was installed on a new Windows 2003 Server, All four cameras are online with the ability to archive up to 14 days.
- Migrated DIT's existing help desk software to new Windows 2003 server and installed MS SQL Server 2000 service pack 3 on the server.
- At the request of the NN Library, installed a Windows 2003 SE Server and migrated all domain users and computer accounts. DIT also installed Symantec CE 8 on the server and workstations, reinstalled Spectrum Server and Client Software, imported all patron account information from Spectrum to Active Directory using the Csvde.exe and Dsmode.exe tools. The NN Museum and the NN Library are located in the same building, at their request; we relocated the existing Cisco wireless equipment from the Library to the South side of the building for use by Museum Personnel.
- Installed and configured the Scholarship Oracle database to allow a streamlined process for the student scholarship award process.
- Installed a dual T-1 redundant load balancing connectivity to Osa Grande, the NN Internet services provider. The communication link to access the Internet was improved and made more reliable.
- Finished installation of a fiber network from DIT to the Police Department and connected many other departments and programs to the fiber network.
- DIT provided (6) certified Microsoft and (2) certified Oracle DBA training, (1) Access Database for many DIT IT personnel.
- A helpdesk application was designed, created, and implemented by staff at DIT. This application is now 100 % in use to track and monitor all service requests made by NN employees. Modifications and refinements are being done on a weekly basis. Interest by external organizations to use this system has been generated; it may be possible to share/lease this application to Entities, Companies, or other tribes.

- DIT applied for a SPIN number with the FCC, was granted a number and accordingly applied for E-Rate funds in the amount of 25 million dollars. This was a very competitive bidding process that involved many well known IT organizations. DIT has been awarded the grant.

Department of Information Technology 2005 – 2007

- Contracted with AT&T using the FCC FTS2001 telecommunication contract signed by the Navajo Nation President. This enabled us to acquire two OC3 155 mbps for the Nation's bandwidth and internet services. Also to install T1 - connectivity to all Chapter Houses so they will have high-speed internet, Voice over Internet Protocol (VoIP), distance learning, telemedicine, etc.
- Implement a 54 mbps wireless connectivity from Admin I building to the NN Sports Center. Then broadcast the wireless to the departments and programs on the south side of the Hwy 264. This includes Air Transportation, Rangers, Retirement, NN Department of Transportation, Parks and Recreations, Fair Office, Veterinarian, and Navajo Nation Library connect to the Department of Information Technology's high-speed network.
- Installed a 75 mile microwave radio from DIT to White Rock Chapter to connect with a high-speed T1 internet for televideo conferencing, telemedicine, distance learning and VoIP for telephone use.
- DIT been able to acquire 1.3 million of dollars from the State of New Mexico using Navajo Technical College as its fiscal agent. This money has been used to acquire towers and radios to bring an OC3 from the University of New Mexico to the Navajo Technical College.
- DIT has been able to acquire nine important strategically located towers to implement an OC3 high-speed broadband. The towers are in 1) two in Roof Butte, 2) one in Red Mesa, 3) one in Marsh Pass, 4) one in Cow Springs, 5) one in Cameron, 6) and a communication site in Tonalea.
- Implement a redundant Storage Area Network Appliance in DIT's data center.
- Upgraded many Chapter House fiber cables.
- Installed newly upgraded Bill and Melinda Gate's Personal Computer for many Chapter Houses.
- Been able to install T1 connectivity to Child Support Enforcement, Dine College, Toyey Police Academy, Air Quality, Ft. Defiance Facility Maintenance, White Rock Chapter, Shiprock Judicial, Crownpoint Judicial, Kayenta Judicial, Tuba City Judicial, Chinle Judicial, Window Rock Judicial, Dilkon PD that are connected to the Navajo Nation Virtual Private Network (VPN) using the AT&T MPLS.
- Create MS SQL database for Elections, Department of Emergency Management, Emergency Medical Service, Housing and Weatherization
- Created and implementation MS Sharepoint services for DIT, Division of Youth, E911, Judicial, Legislative Office, OSERS.
- Migrated Servers to DIT's computer room for EPA, Scholarship Office, Personnel, IMS PD and Elections.
- Upgrade the Navajo Nation Technology Plan and policies.
- Acquire Cisco Call manager at the central Window Rock hub.

- Met with the CIOs from State of AZ, UT and NM for IT collaboration.
- Seek State funding from AZ, UT and NM.
- Acquire an estimated amount of 23M from ERATE.
- Been able to complete installation of Internal Connection to eight NETC school districts. Have installed BNI video conferencing equipment for distance learning.

Navajo Nation IT Summit 2004

Inaugural Navajo Nation Information Technology Summit held last week "A SUCCESS" June 7-10th, 2004. (www.nnits.navajo.org)

Department of Information Technology

"Formulating the Navajo Nation Information Technology Strategic Roadmap"



Mr. Harold Skow
Director

DIT Summit Committee:

Shirley M. Barney - Chairperson
Alexander Largie - Webpage Design
Vangie Sandoval - Finance
Royetta Woodie - Registration
Julia Hardy - Registration
Donald Spencer - Sponsorship
Derrick Yazzie - Exhibit
Wilfred Keeto - Exhibit

Bringing together all Navajo Nation (NN) branches, departments, divisions, Chapter Houses, Entities and other Information Technology (IT) consortiums that have vested interest in Information Technology initiatives within the Navajo Nation.

With the advent of many forms of Information Technology implementation on the Navajo Nation in breaking the barrier of the "Digital Divide", it has become apparent that a holistic IT strategic direction needs to be established. Many Navajo Nation departments and other groups are being saturated with new technology that the Navajo Nation has never been exposed to. As each department and group implements technology to meet their needs they unknowingly created what is known as "IT Islands". The Department of Information Technology (DIT) in collaboration with other NN IT professionals and other IT entities are strategically formulating a holistic IT road map for the Navajo Nation. The Navajo Nation IT summit is a critical part of the process in constructing such a roadmap. Another crucial part is the involvement of the stakeholders; all departments, Entities and IT Consortiums that work directly with technology within the Navajo Nation.

NN departments and other IT groups are currently implementing IT projects on the Navajo Nation that are large in scale and have cost figures that range into millions of dollars. The task to bring together all IT entities and align their efforts to a common mission and goal is a tremendous undertaking. All NN departments, entities and IT consortiums can meet, exchange strategies, and create a mutual working relationship that will benefit the Navajo Nation as a whole. The intent is to create Memorandums Of Agreement (MOAs), Memorandums Of Understanding (MOUs), determine how we can share network infrastructure and resources, and start reducing the cost of IT implementation. Another goal of the NN IT summit is to establish a consortium of persons/entities that have a vested interest in the positive growth and advancement of NN IT. To utilize this augmentation of IT to be competitive in all aspects of IT related functions for the Navajo Nation, to decrease the redundant expenditure of resources in IT related activities for the Navajo Nation, and ultimately to provide enhanced service delivery to the people of the Navajo Nation.

The output from the summit will put together the Navajo Nation Information Technology Business Case. The business case will contain the fundamental structure that corporate enterprise level environment use for their IT organization. The content will include a cohesive IT organizational structure under the direction of a Chief Information Officer (CIO) to provide visioning and direction.

Navajo Nation IT Summit 2006

It is paramount and imperative to unite our efforts within the Navajo Nation to align our focus and priorities in technology implementation. Government and corporate environments dictate that information technology be given priority status in order to allow adequate growth and beneficial advances for organizations. The introduction of the automobile to the traditional Navajo lifestyle radically changed the abilities we had as a people and culture to achieve our desired objectives. Today, we would find it very difficult to perform our daily activities, if the automobile were non-existent. Present day



scenario, the resources and tools made available to the Navajo Nation government through information technology are analogous to the introduction of the automobile into our society. The benefits of adopting information technology are

enormous for our people in terms of education, economic development, access to vital services, preservation and furtherance of our culture.

Each entity that has vested interest in technology on the Navajo Nation is at a crucial pivotal point on laying the technology foundation that will ensure that our scarce resources are maximized. It is imperative for all governmental employees, including our leaders and others to understand the difference between “*best practice*” and “*best effort*”.

It is the intent to once more bring together all Navajo Nation entities, including but not limited to, branches, divisions, departments, programs, Chapter Houses, and other Information Technology (IT) consortiums that have vested interest in IT direction and implementation on the Navajo Nation.

At this summit many topics will be discussed to further our knowledge in technology for the betterment of our future and to help in “*Diminishing the Digital Divide*”. As the whole world is thriving using many of the benefits of technology, we on the Navajo Nation still yet need the fundamental infrastructure to provide the maximum benefits of technology. Every participant is important and is needed to provide their personal concepts on NN IT growth as they all voice their comments.

Today's technology will help reduce our cost in receiving important governmental services with *e-government*. Navajo citizens will have the capability to communicate through high-speed broadband internet to their agencies and central government to receive much needed services without driving long distances. Other benefits, such as *e-learning* is at the brink of reality on the Navajo Nation. Navajo Nation citizens will be able to take online courses from remote universities and colleges without leaving the Navajo Nation. Other economic opportunities will evolve as we build out the broadband technology across the Navajo Nation.

I want to welcome and thank all participants to the 2nd Navajo Nation Technology Summit. Let's all convene and collaborate at this summit to strive in creating unity and strength in developing our technological intellectual knowledge that will help us now and for our future generations.

The Office of the Speaker – Legislative Branch Fiber Project

The Office of the Speaker, legislative technical team and the Department of Information Technology have collaboratively and cooperatively configured fiber connectivity to the Navajo Nation Council Delegate chamber, Legislative offices, Office of the President/Vice-President and all of the departments on the east campus of Window Rock governmental compound. The project was in 2004-2005.

ATTACHMENT A:

Department of Information Technology's Three Year Strategic Plan.

Mission Statement:

The Department of Information Technology's primary purpose in Information Technology is to pursue establishment of a stable, reliable, and readily accessible technology infrastructure to sufficiently meet the Nation's needs in regards to service provision for the people, competitiveness with similar entities, and implementation of progressively advancing technology. Given the variables involved in rapidly changing technology, DIT will make changes to its three year strategic plan to align its goals and mission to that of the President and Vice-Presidents directions.

Goals: FY-04

1. Implement a wireless communication infrastructure to allow instant mobile access to Navajo Nation data, the Internet, E-mail communication, and other information technology resources. This would encompass the following areas:
 - Window Rock campus
 - St. Michaels
 - Ft. Defiance
 - Tse Bonito
2. Upgrade the facilities at the Department of Information Technology (DIT) to provide an information technology infrastructure that will allow high availability and redundancy to all Users of the infrastructure.
3. Upgrade the existing Navajo Nation communication link that connects to the external infrastructure from a T-1 line to a DS3 communication line to increase the bandwidth available to access the available resources.
4. Install fiber optic connectivity components in the following:
 - Administration building 1
 - Administration building 2
 - Police Department

- Public Safety
 - Labor Relations
 - Staff Development and Training
 - Child Enforcement
 - Education Center
 - St. Michaels
 - Karagen Professional Complex
5. Purchase and implement a Help Desk system to make service provision more effective and efficient.
 6. Install a fiber optic communication link from DIT to the following Branches/Programs:
 - Council Chambers
 - Office of the President/Vice-President
 - Legislative Offices
 - Department of Justice
 - Natural Resources
 - Judicial Offices
 - Records Management
 - Vital Records
 - Public Defender
 - Fleet Management
 - Archaeology
 7. Enhance the existing Payroll system
 8. Coordinate a Navajo Nation Information Technology Summit to:
 - Bring together all Entities on the Navajo Nation who have a vested interest in the positive growth of information technology.
 - Disseminate information on the state of, and the proposed direction of Navajo Nation IT.
 - Identify resources available for assisting the Nation in its IT efforts.
 9. Establish and implement a Navajo Nation Information Technology Standards Group to govern the growth of technology within the environment utilized by the Navajo Nation.
 10. Transition the Voters Registration system onto a new operating environment.
 11. Transition the Scholarship system onto a new operating environment.
 12. Involve Chapter House level IT initiatives

Goals: FY-05

1. Completion of fiber optic communication link project from DIT to the following Branches/Programs:
 - Council Chambers
 - Office of the President/Vice-President
 - Legislative Offices
 - Department of Justice
 - Natural Resources
 - Judicial Offices
 - Records Management
 - Vital Records
 - Public Defender
 - Fleet Management
 - Archaeology
 - Public Safety to NN Inn, Parks and Recreation, Elections, NN Museum, Department of Transportation, Navajo Times, Retirement and Airport.
2. The Navajo Nation IT Core Team will develop a Navajo Nation IT road map.
3. Develop a standard Navajo Nation IT policy.
4. Initiate the planning of a Navajo Nation Point of Presence (POP) to serve as a gateway to the Internet.
5. Sponsor the second Navajo Nation IT summit.
6. Implement an enterprise agreement license for the utilization of the Navajo Nation, this will ensure:
 - Cost savings
 - Validity of licensed Users
 - Improved technical assistance
7. Continued Navajo Nation Network revisions and enhancements
8. Establish new positions within DIT in the following areas:
 - Web Development
 - Network
 - Desktop
9. Formulate and implement a disaster recovery/continuity plan for the Navajo Nation.

10. Involve Chapter House level IT initiatives.

Goals: FY-06

1. Implement the Point of Presence (POP) for the Navajo Nation
2. Acquire funding for the training of DIT staff and implement designated training
3. Establish new positions within DIT in the following areas:
 - Web Development
 - Network
 - Desktop
 - Technical Proposal Writer
4. Increase the capabilities of the DIT Data Center.
 - Network
 - Data storage
 - Technical Support
5. Establish a Chief Information Officer (CIO), or create a Division of Information Technology.

Goals: FY-2007

1. Navajo Nation IT Summit 2007 . Attendees will be all *the Internet to the Hogan* partners, all governmental branches, departments, programs, chapter houses and all other entities on the Navajo Nation with vested interest in Information Technology (IT).
2. Construct telecommunication towers and light up and test connectivity. Light up and test as many corridor in a joint effort across the Navajo Nation and externally to the Universities. The Lambda Rail with a OC3 bandwidth coming from the University of New Mexico to the Navajo Technical College in Crownpoint, NM will be the initial construction of the Navajo Nation broadband backbone.
3. The acquirement of the nine communication towers located in very important strategic locations on the Navajo Nation. The nine towers will be established with residency with radio communication the fall of 2007. These communication towers will have an OC3 bandwidth that will eventually be connected to the Lambda Rail.

4. Established connectivity between the Navajo Technical College OC3 network to the Window Rock Summit towers and back to the Department of Information Technology's primary network.
5. Connect Coconino Community College and Dine College Tsalie Campus to the Navajo Nation AT&T MPLS network for distance learning. Create MOU between the Navajo Nation and Dine College to share resources.
6. Acquirement of a signature software that will enable all users to be able to sign documents digitally from anywhere internet is available. This will enable the Navajo Nation to go paperless and save money.
7. Start the reorganization of the Information Technology organizational structure. Designed the structure for an Office of the Chief Information Officer.

Goals: FY-2008

1. Navajo Nation IT Summit 2008 . Attendees will be all *the Internet to the Hogan* partners, all governmental branches, departments, programs, chapter houses and all other entities on the Navajo Nation with vested interest in Information Technology (IT).
2. Initiate an Enterprise License with Microsoft to save millions of dollars spent each year and strive to obtain a Return on Investment (ROI).
2. Light up and test as many corridors in a joint effort across the Navajo Nation and externally to the Universities.
3. Acquire funding for the training of DIT staff and implement designated training.
4. Establish new positions within DIT in the following areas:
 - Web Development
 - Network
 - Desktop
 -
5. Increase the capabilities of the DIT Data Center.
 - Network Redundancy
 - Data storage fail-over environment
 - Technical Support
6. Establish a Chief Information Officer (CIO), or create an Office of the Chief Information Officer.

Management's role in Achieving Goals and Objectives

- Coordinate timelines and project outlines
- Ensure User and higher level management buy-in by lobbying and doing presentations
- Make certain the Navajo Nation IT summit is a success
- Increase the skill level of DIT personnel.
- Designate and delegate roles and responsibilities to DIT staff to achieve the goals and objectives, monitor through project management tools, milestones, accomplishments, and the resulting performance appraisal standards and accompanying merit increases.
- Achieve and ensure customer satisfaction.
- Seek and secure outside funding sources (Grants)

Resources available

Internal

- DIT Staff
- General Funding
- Division Director
- Navajo Nation Telecommunications Regulatory Commission (NNTRC)
- Legislative Branch
- Emergency Management

External

- Grants-Federal, State, etc.
- Vendors
- GSA Federal Technical Group
- HIS
- States
 - New Mexico
 - Arizona
 - Utah

Potential Barriers in Achieving Goals and Objectives

Internal

- Existing IT islands
- DIT Budget
- Politics
- Unsatisfied Users
- Employee Turnover
- Consultants
- Crucial equipment breakdown

- DPM Web training

External

- Private data center
- Federal Funding
- Warranties and contract expiration
- Businesses folding

Projected Budgets

FY-04

\$1.4 million + \$268,000 = 1.668 million

FY-05

\$1.4 million + \$256,000 = 1.656 million

FY-06

\$1.4 million + \$555,000 = 1.955 million

FY-07

\$1.4 million + \$250,000= 1.650 million

FY-08

\$1.4 million + \$500,000 = 1.9 million

Staffing Needs

FY-04

Unchanged from form submitted to OMB

FY-05

NEW

- Web Development
- Network
- Desktop

FY-06

NEW

- Web Development
- Network
- Desktop

FY-07

NEW

- FMIS Server Administrator

- FMIS Security Administrator
- FMIS Web Administrator
- FMIS Report Writer
- Two FMIS Database Administrator
- Web Development
- Network
- Desktop

FY-08 NEW

- FMIS Server Administrator
- FMIS Security Administrator
- FMIS Web Administrator
- FMIS Report Writer
- Two FMIS Database Administrator
- Web Development
- Network
- Desktop

Staff Development and Training Needs

FY-04

- Helpdesk Technician
- Helpdesk Administrator

FY-05

- Wireless Technology
- Point of Presence (POP)

FY-06

- Point of Presence (POP)
- Implementing Security
- Managing and administering security
- Voice over Internet Protocol (VoIP)
- Exchange 2005
- Microsoft Share Point
- Security Administration
- Storage Area Network Appliances (IP SAN)
- Disaster Recovery
- Microwave Tower Maintenance
- MS SQL server administration
- Oracle10i Database Administration

FY-07

- Implementing Security
- Managing and administering security

- Voice over Internet Protocol (VoIP)
- Exchange 2005
- Microsoft Share Point
- Security Administration
- Storage Area Network Appliances (IP SAN)
- Disaster Recovery
- Microwave Tower Maintenance
- MS SQL server administration
- Oracle10i Database Administration

FY-08

- Network Monitoring
- Implementing Security
- Managing and administering security
- Voice over Internet Protocol (VoIP)
- Exchange 2005
- Microsoft Share Point
- Security Administration
- Storage Area Network Appliances (IP SAN)
- Disaster Recovery
- Microwave Tower Maintenance
- MS SQL server administration
- Oracle10i Database Administration
- PC Repair and Troubleshooting
-

Strategies for Enhancing Services to Clientele

- Enhance customer service
- Increase system uptime, staff availability, and do presentations on the functions of DIT.
- Upgrade DIT data center
- In-house training
- Customer surveys
- Navajo Nation IT summit

Revenue Generating Plans and Projects

- Offer a Point Of Presence (POP)
- Charge departments for services offered
- Establish a continental United States wide hub center to house data for organizations

How Will Performance Standards Be Measured?

FY-04

Quarterly Reports
Budget and Finance performance criteria
Annual performance appraisals
Significant accomplishment reports
Agency profiles
Oversight committee reports
Audits

FY-05

Quarterly Reports
Budget and Finance performance criteria
Annual performance appraisals
Significant accomplishment reports
Agency profiles
Oversight committee reports
Audits

FY-06

Quarterly Reports
Budget and Finance performance criteria
Annual performance appraisals
Significant accomplishment reports
Agency profiles
Oversight committee reports
Audits

FY-07

Quarterly Reports
Budget and Finance performance criteria
Annual performance appraisals
Significant accomplishment reports
Agency profiles
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FY-08

Quarterly Reports

Budget and Finance performance criteria

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Agency profiles

Oversight committee reports

Audits