Veterans Administration
IPv6 Pilot
Patient Monitoring

VA IPv6 Pilot – Patient Monitoring

- Overview
- Pilot Summary
- Pilot Design
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VA IPv6 Pilot – Patient Monitoring

- Overview
  - The VA is investigating various initiatives for using IPv6 to enhance the VA's Core Mission goals.
  - Take advantage of the new functionality built into IPv6 including
    - Security
    - Ability to self configure IP Address and gateway
    - Peer to Peer connectivity
    - Greater address space

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- Overview (continued)
  - This initiative focuses on remote real time patient monitoring and communication.
    - Supports a patient focused care model
    - Provides for better clinical reaction time
    - Allows clinical staff to observe symptoms when they occur instead of getting briefed on them after the fact
    - Enables clinical staff to ensure treatment plan compliance by the patient

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- Overview (continued)
  - Examples of patient conditions that would benefit from real time patient monitoring include:
    - Cardiac disease
    - Sleep disorder
    - Diabetes
    - Alcohol/drug dependence.

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- Pilot Summary
  - A number of patient monitoring options were reviewed
  - These included:
    - NASA System
    - Several Firefighter/Police/Soldier monitoring systems
    - Temperature Monitoring Systems
    - EKG Monitoring Systems
    - Sleep Disorder Monitoring Systems
  - Issues encountered:
    - Product not ready for commercial deployment
    - Product does not support IPv6 connectivity.

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- Pilot Summary (continued)
  - Sleep disorder patient monitoring was selected for this pilot
    - Is ready for commercial deployment
    - Includes IPv6 support
    - It's a good fit for the VA since a number of VA facilities are already monitoring patients with sleep disorders problems
  - This pilot will implement a remote monitoring model
    - place monitoring equipment at the patients home
    - Utilize IPv6 for auto config and security to transmit data back to the VA
      - Means that IT and clinical staff don't have to go out to the patients home

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- Pilot Design
  - Select a Sleep Disorder Monitoring Product that meets the following requirements:
    - Makes a remote monitoring system
    - The system supports IPv6 connectivity
    - Collects both clinical data and video of the patient
    - Supports bidirectional communication to the patient
    - Is acceptable to the staff at the facility selected to participate in the pilot
  - Select an test area meeting the following criteria:
    - Medical Center is conducting sleep disorder treatment
    - A local Internet connection provider support IPv6 connections across their network backbone.
  - Set up three to five test groups of fifteen patients each
  - Establish connections to the selected carrier to each patient home in the test groups

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- Pilot Design (continued)
  - Establish a connection from the selected carrier to the participating facility
  - Send a monitoring system home with the patient
  - Monitor the patient for two week period
  - The remote system will forward the data and video to a server located at the VA using an encrypted IPv6 connection.
  - These data files and video files will be monitored by a staff at the medical center. If staff see a problem with the patient, they will be able to take appropriate care steps in a timely manner.
  - Security
    - The collection server will not be inside the VA network
    - Instead of putting sensitive patient data on the pilot system, fake sensitive patient will be loaded and linked to a separate file of real sensitive patient data

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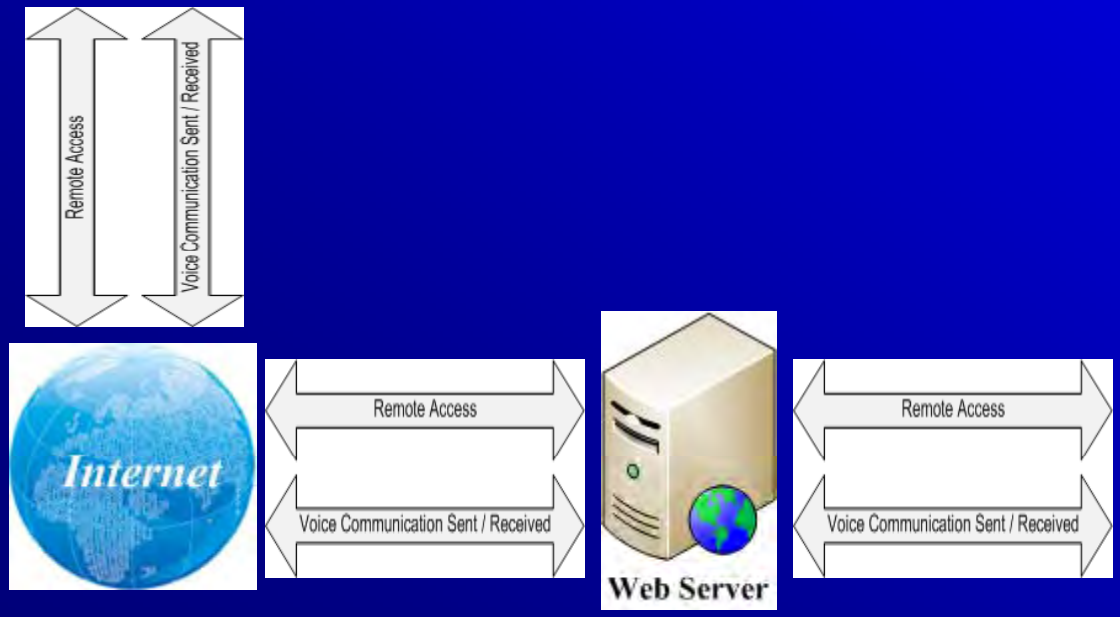
Diagram of the connection from the patients home to the medical center.



VA IPv6 Pilot – Patient Monitoring

- Product
  - The product selected is provided by Cleveland Medical Devices (www.clevemed.com)
  - Composed of three parts
    - Sapphire PSG Unit
      - 22 channel collection unit
      - Collects the following data physiological data:
        - » 3 EEG
        - » 2 EOG
        - » 3 EMG (chin, 2 legs)
        - » 2 respiratory efforts
        - » 2 airflow (pressure and temperature)
        - » ECG
        - » Pulse oximetry
        - » Snore

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- Product (continued)
  - Dream Port Portable Sleep Gateway (PSG)
    - Receives data wirelessly from Sapphire PSG unit
      - » 900MHz
    - Transmits audio and video to the management system
    - Receives audio from the management system

  - Crystal PSG Management System

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- Hurdles
  - There are no carriers that support IPv6 across their network
    - There are carriers that allow users to run IPv6 over point to point connections but not natively across their network
    - Solution is to use IPv6 over IPv4 dongle to run IPv6 connection back to the monitor system

VA IPv6 Pilot – Patient Monitoring

- Pilot Design – Ver 2
  - Select a Sleep Disorder Monitoring Product that meets the following requirements:
    - Makes a remote monitoring system
    - The system supports IPv6 connectivity
    - Collects both clinical data and video of the patient
    - Supports bidirectional communication to the patient
    - Is acceptable to the staff at the facility selected to participate in the pilot
  - Select an test area meeting the following criteria:
    - Medical Center is conducting sleep disorder treatment
  - Select an IPv6 over IPv4 Dongle
  - Set up three to five test groups of fifteen patients each

VA IPv6 Pilot – Patient Monitoring

- Pilot Design – Ver 2 (continued)
  - Establish connections to the selected carrier to each patient home in the test groups
  - Establish a connection from the selected carrier to the participating facility
  - Have an IT staff person take a monitoring system to the patient's home and set it up
  - Monitor the patient for two week period
  - The remote system will forward the data and video to a server located at the VA using an encrypted IPv6 connection.
  - These data files and video files will be monitored by a staff at the medical center. If staff see a problem with the patient, they will be able to take appropriate care steps in a timely manner.

VA IPv6 Pilot – Patient Monitoring

Item	Item Description	Quantity	Unit Cost	Total Cost	Comments
1	Sets of Patient Monitoring Units and base stations	15		330,200.00	
2	Gateway Server	1		0.00	included in item 1 above
3	Connection for gateway server	1			to be provided by LDS
4	Connection for patient monitoring and base stations	15			to be provided by LDS
5	Backend software application to monitor server files	1		3,000.00	
6	Staff to monitor patients during test	5	300.00	10,500.00	unit cost is for one person per night. Total cost assumes five staff monitoring 15 patients every other night for 14 days.
7	IT Staff to support pilot	1		0.00	included in item 1 above
8	IPv6 enabled Video Conferencing desktop units	15		0.00	included in item 1 above; this is a low light camera. Does pan/tilt/zoom. Can do screen capture.
9					
10					
			Sub Cost:	**343,700.00**	
			Overage Amount:	**51,555.00**	
			Total Cost:	**395,255.00**	

VA IPv6 Pilot – Patient Monitoring

- Questions?

VA IPv6 Pilot – Patient Monitoring

- Contacts:
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    - Joe Lamont
    - 216-791-6720 x1004
  - Pilot Lead
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