



MN NG911 Overview

10/28/2011

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MN NG911 Overview Agenda

1. Review of Programs Three Phases
2. Project Objectives: Implementing an IP Network to all PSAP
3. Network Overview
4. Next Gen Components at the PSAP
5. Equipment Installation
6. Resiliency with circuit outage
7. Measure and Monitor Network
8. FoCR (Function of Code R)
9. Migration Methodology
10. 911 Plan Change Letter
11. PSAP Installation Guide

Review of Programs Three Phases

- ▶ Phase 1 completed September 27, 2010
 - Over 35,000 Interop Call Transfers made!
 - Call Origination portion postponed given risk analysis of implementing in network with routing performed by Legacy Selective Routers.
 - Call Origination – for phone exchanges in border PSAP areas, directing call to the intended PSAP without having additional step of Call Transfer.
- ▶ Phase 2 now focused on to two PSAPs:
 - Carver (CenturyLink Network/Data; IES CPE)
 - Kandiyohi (IES Network/Data; IES CPE)
- ▶ Phase 3 remains as migrating remaining MN PSAPS (112 at this time)

Phase 2 Objectives

1. Demonstrate that the Qwest iQ MPLS network is a reliable alternative to the existing EM and ALI circuits.
2. Test methods and processes utilized to install and migrate a PSAP from the legacy EM trunking and ALI to NG9-1-1 network.
3. Exhibit adequate maintenance support for the PSAP Gateway Modules.
4. Demonstrate the ability to interface with the IES database including the implementation of Function of Changer R (FOCR).
5. Demonstrate the network monitoring and reporting methodologies used to measure the health and performance of the network elements.
6. Identify and document PSAP migration strategy for entire project.

Phase 3 Objectives

1. Migrate all MN PSAPs to the IP network
2. Identify a strategy for removing Legacy Selective Routers out of the network (Phase 4 planning.)
3. Identify the requirements to connect to another Emergency Services Internet Protocol Network (ESInet)
4. Understand and document where the diversity of the network ends to each PSAP and implement a thoroughly tested NG911 solution utilizing NENA standards and open architecture.

Program Scope

- ▶ 114 PSAPs to Migrate in Minnesota
 - Network Scope – New Network From Legacy Selective Router (LSR) to the PSAP.
 - CenturyLink and IES will have its LSRs serve as aggregation points of entry into the IP network.
 - PSAPs connected to IQ network
 - ALI Links will be migrated from the 56 Kb circuits to run on IP network
 - ALI Data Scope
 - ALI data reporting will be impacted by deployment of FOCR, review underway of its impact to existing metrics
 - Reporting Scope
 - New Network Reporting using reporting tools, Control Center (formerly QControl) and Clearview
 - Initial VQES MOS (Mean Optimum Score) test provided upon network and equipment Installation.

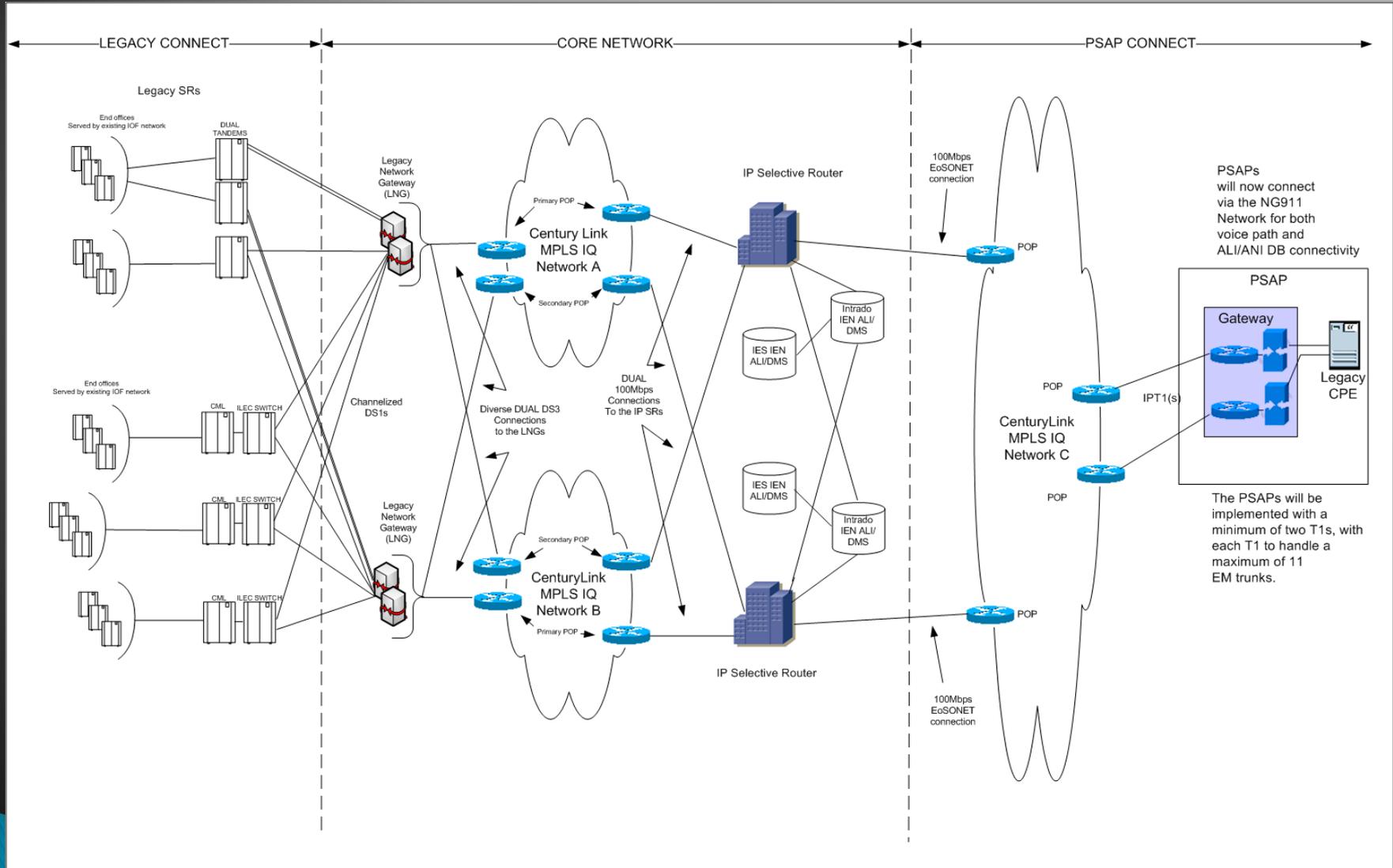
Additional Program Scope

- Implementation of Function of Change R (FOCR)
 - Required for IES PSAPs.
- Call Origination Re-visit
 - Not implemented in Phase I given legacy risks – can be implemented in a IP environment.
- Potential implementation of Optional, Vendor-Neutral Router at the PGM (PSAP Gateway Module)
 - Optional Router to serve in potential use of 3rd party Applications
- Potential provisioning of standard config. to 3rd party host systems
 - Next Gen PSAP equipment and network to host system no different from traditional PSAP installation.
- CenturyLink database to be compatible with the State's GIS database as the source GIS data, should the State begin trialing a GIS application.

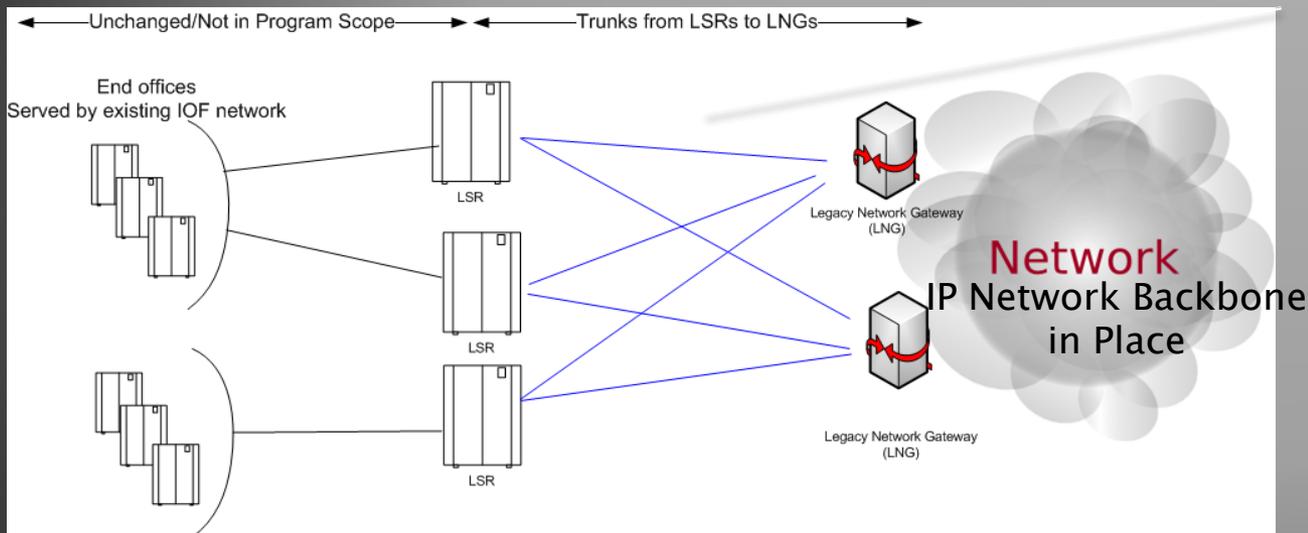
Not in Program Scope

- ▶ Next Generation Applications, such as Text Messaging, IP Alternate Routing or GIS (though can be addressed in separate projects)
- ▶ For Host/Remote Solutions, anything beyond the network provisioning, monitoring and installation of a standard equipment configuration to the standard demarcs.
- ▶ Wireless/VoIP carriers migrating from the 12 MN LSRs to the LNGs (though can be addressed in separate projects)

Next Generation 911 Network Overview

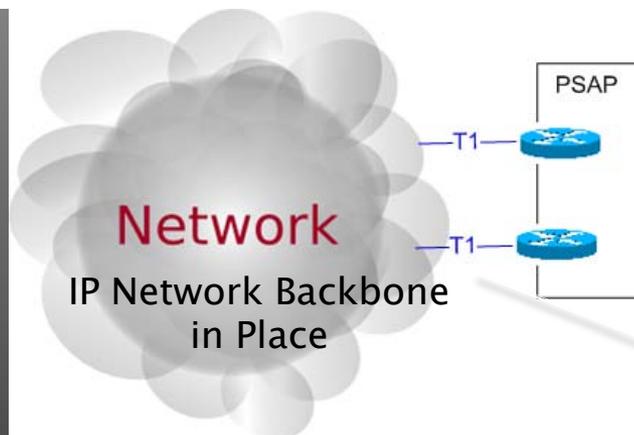


IP Network to Provision



New Trunks
Legacy Selective
Routers (LSRs) to
Legacy Network
Gateways (LNGs)

All MN PSAPS
Interoperable in
using universal 3
Digit Star Codes



Diverse T1s
to the PSAP

Location of Two Legacy Network Gateways for MN

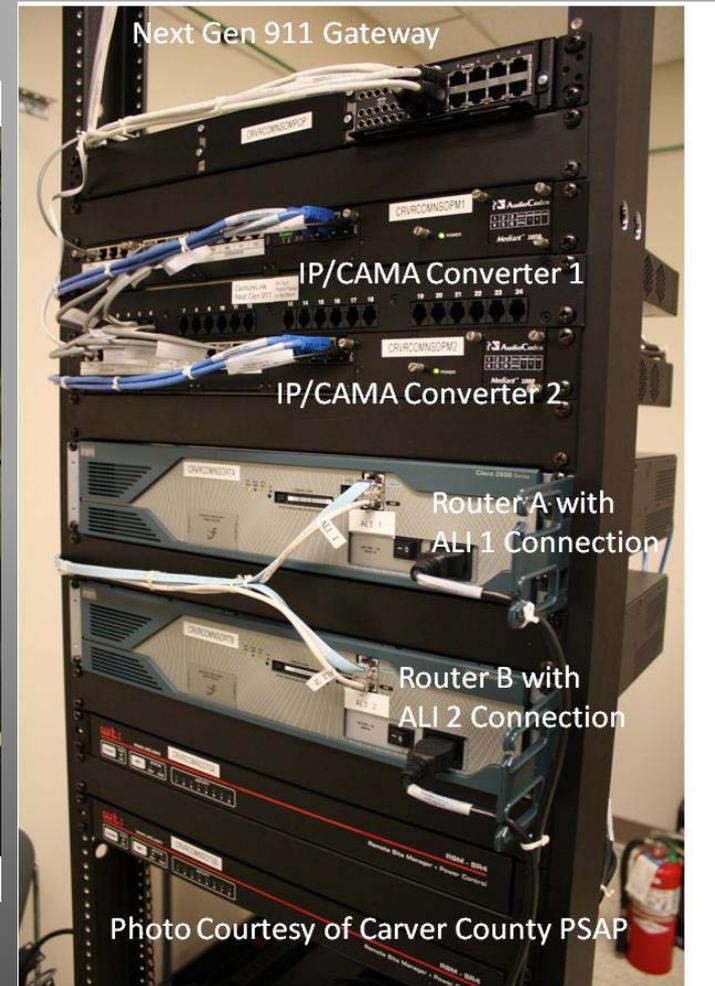
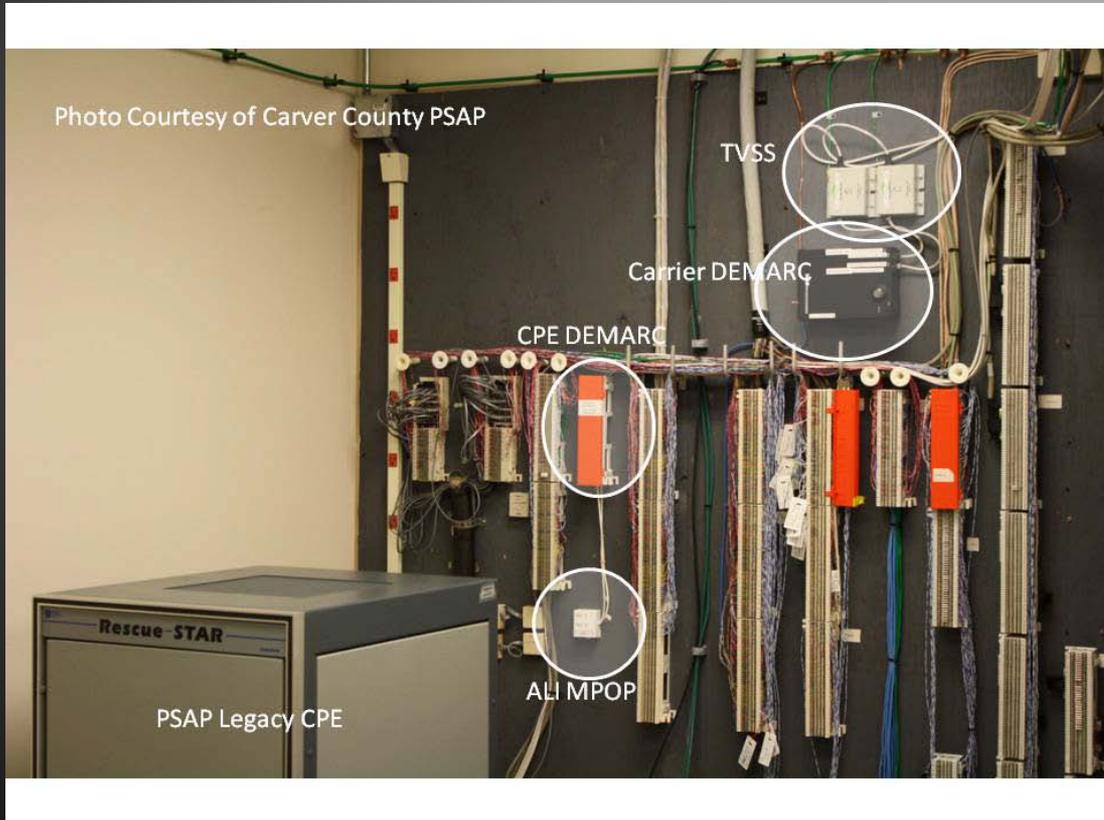
“511 Building” in Minneapolis



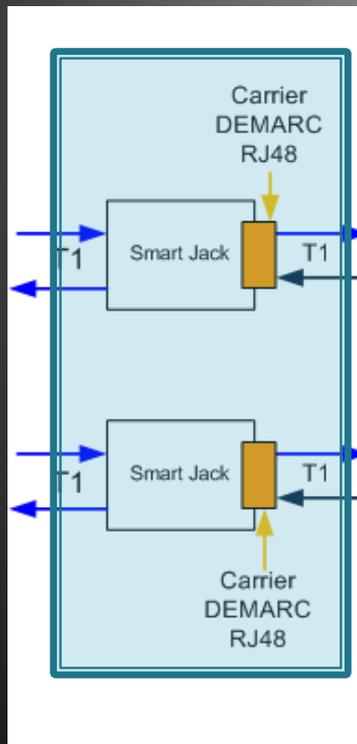
Atomic Data Center in Edina



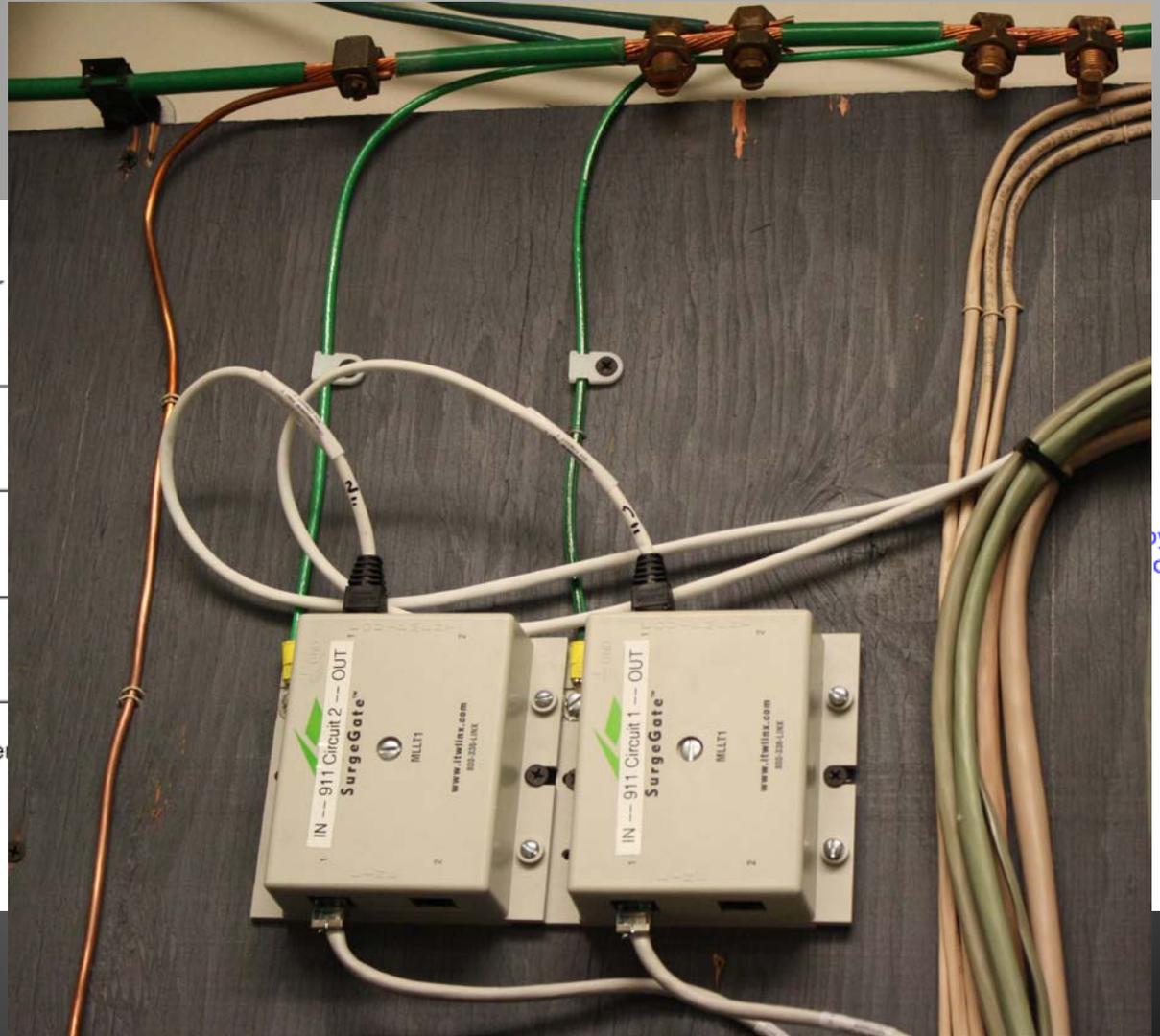
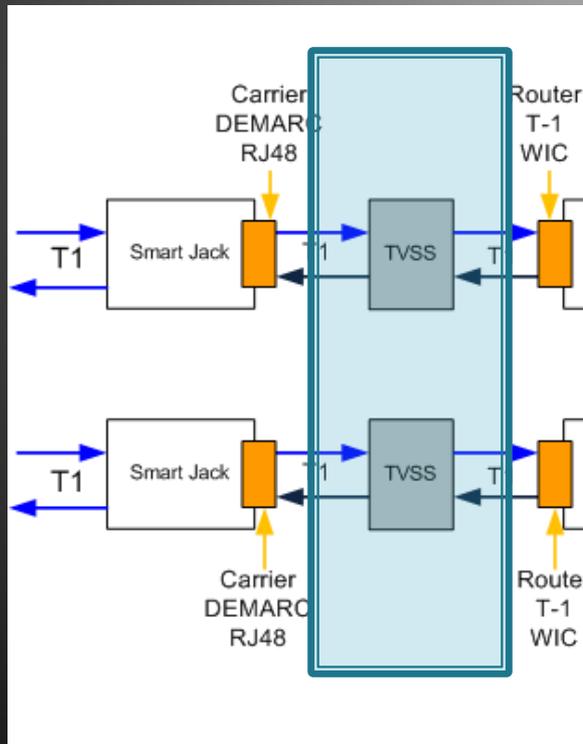
Walkthrough of the Configuration/Equipment at the PSAP



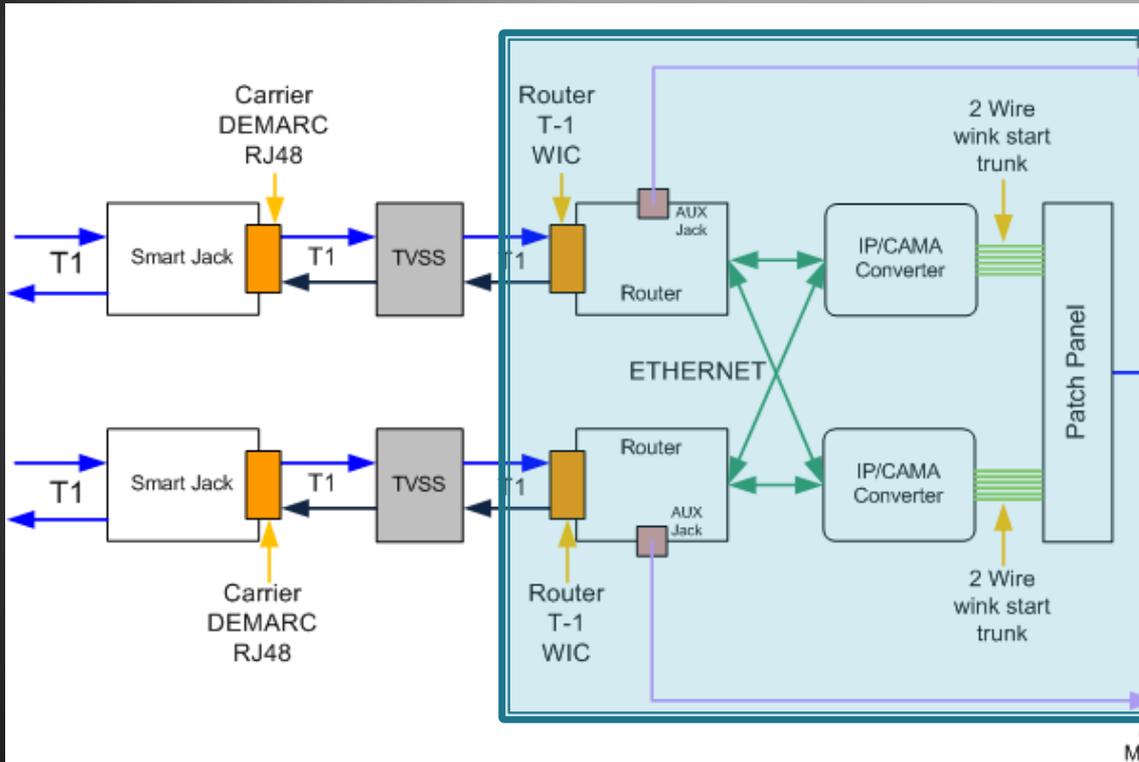
Carrier Demarc (Extended into room with equipment)



Transient Voltage Surge Suppressors (TVSS)



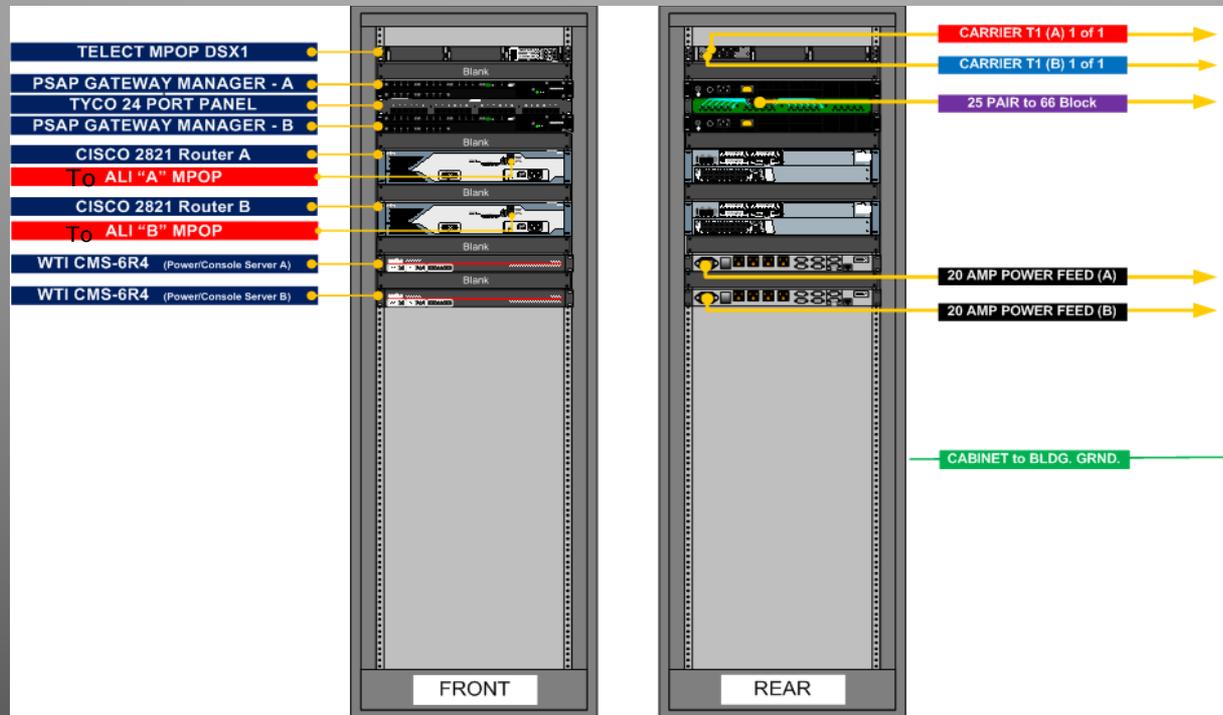
PSAP Gateway Manager



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More on PSAP Gateway, commonly referred to as PGMs

PSAP PGMs in cabinet



Smaller Cabinet, Rack or Wall mount options also available

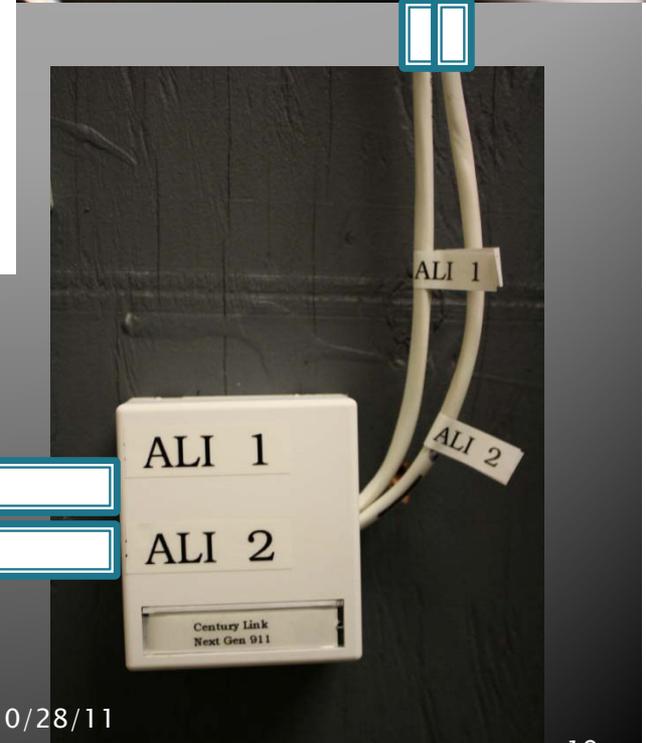
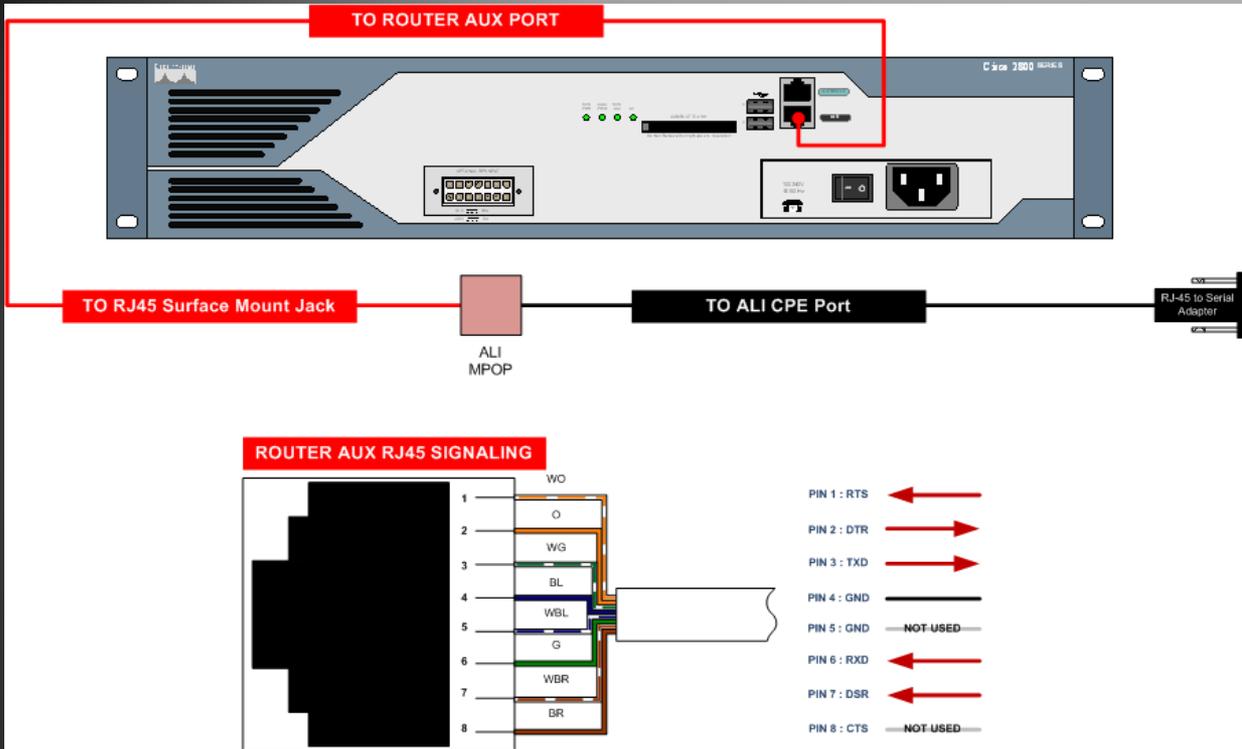
Install Team brings the housing equipment with them at time of Install

More on PSAP Gateway, commonly referred to as PGMs

Voice/Network Components at the PSAP

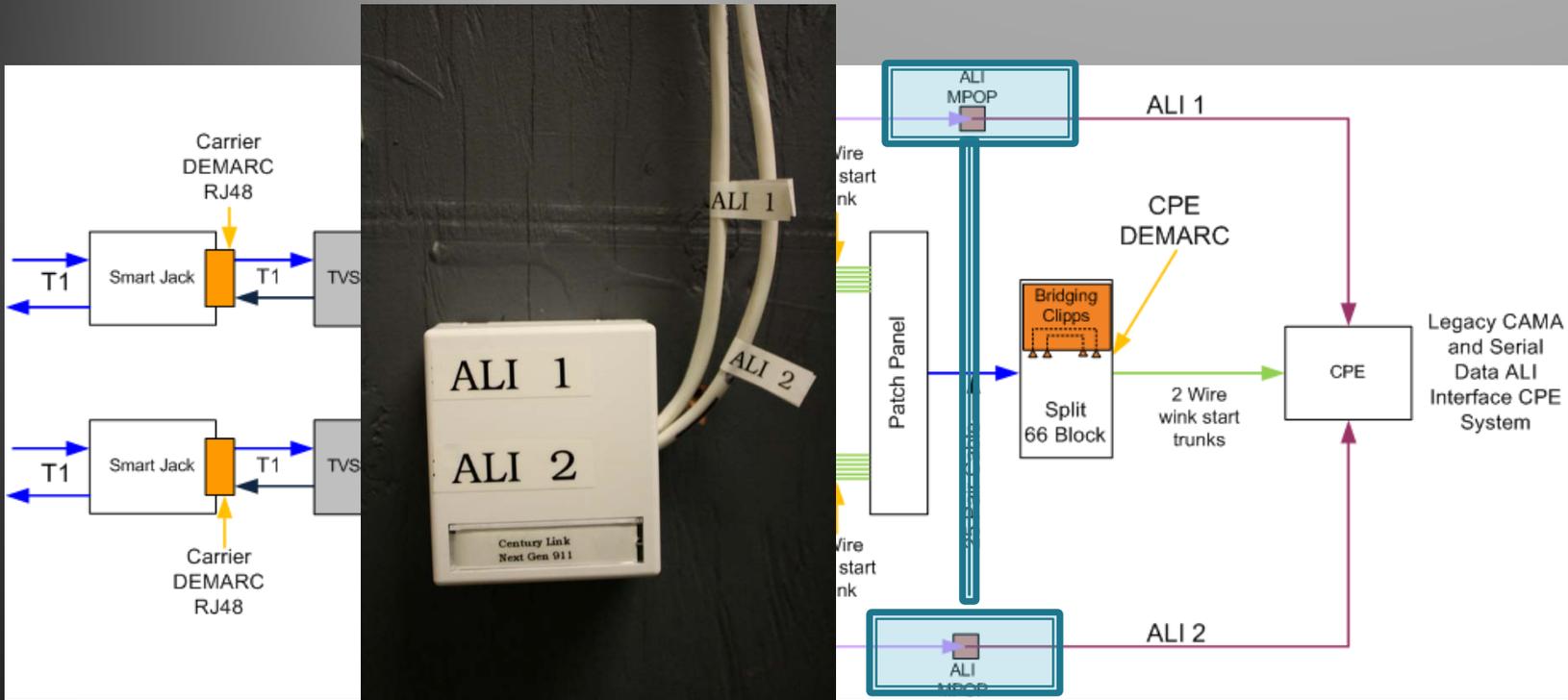


More on PSAP Gateway, commonly referred to as PGMs

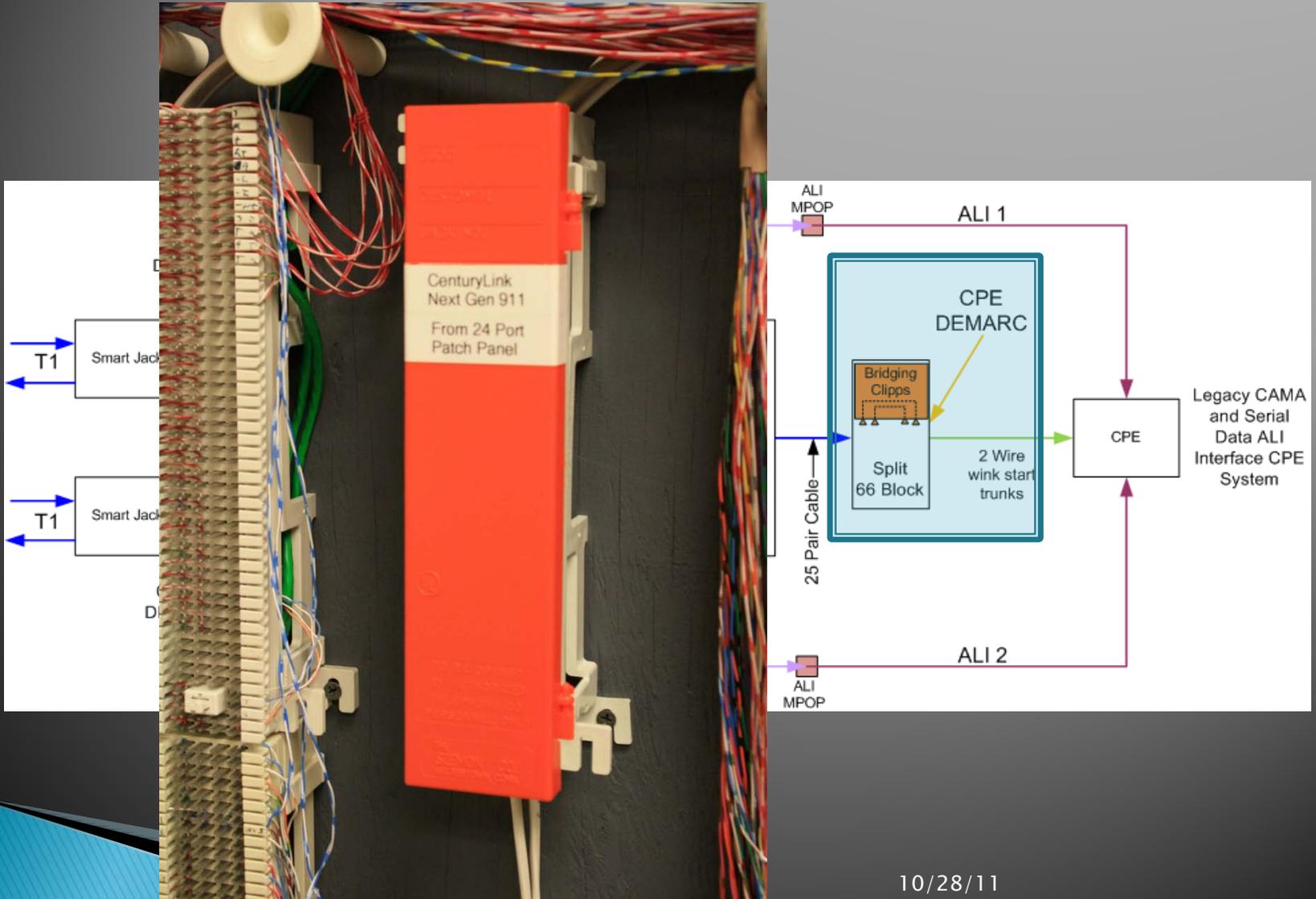


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ALI MPOP (Minimum Point of Presence) Meet Point between CPE Vendor/IT Support and NG911 Install Team



CPE DEMARC



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Install Team Process at the PSAP

Stage 1 Site Analysis and Component Preparation

Engineering analysis of specific location site survey data

Receipt and Inventory of Network Equipment

Stage 2 Deployment Kit Creation, Testing and Delivery

Staging and configuration of devices

Mounting the equipment in the appropriate housing (Rack/cabinet)

Build cabling harnesses; Power testing of Equipment

Kit preparation for transport and delivery

Stage 3 On-site installation

Arrive on site as scheduled

Verification of deployment kit;

Installation of cabinet/rack deployment kit

Secure cabinet/rack and providing required bracing

Verification of Power; Connection of Network; Connection of site wiring

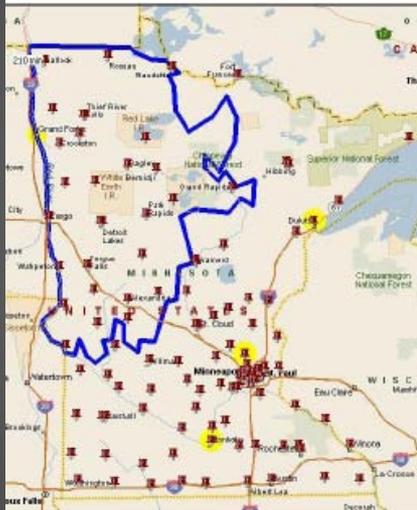
Testing of circuit connectivity

Verification of installation completion

*Install Team
is
Minnesota-
based*

Field Support

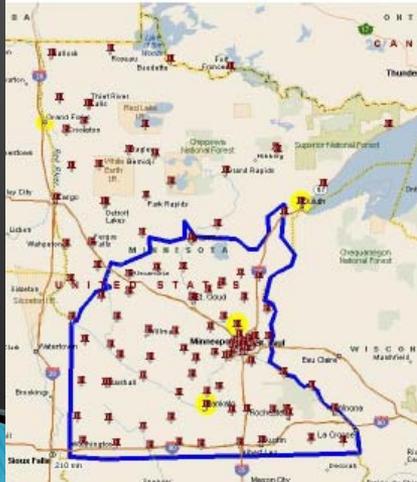
Grand Forks Depot – 4 Hour Response Coverage



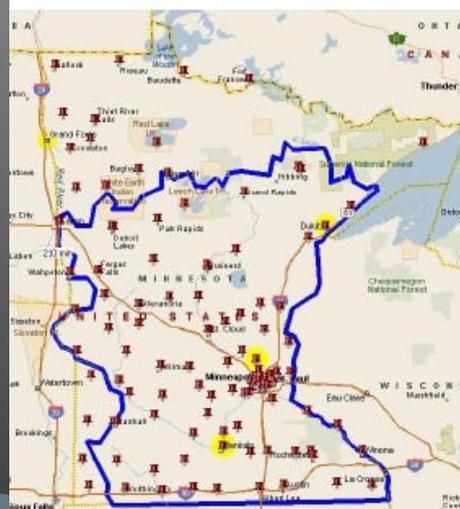
Duluth Depot – 4 Hour Response Coverage



Mankato Depot – 4 Hour Response Coverage



Minneapolis Depot – 4 Hour Response Coverage



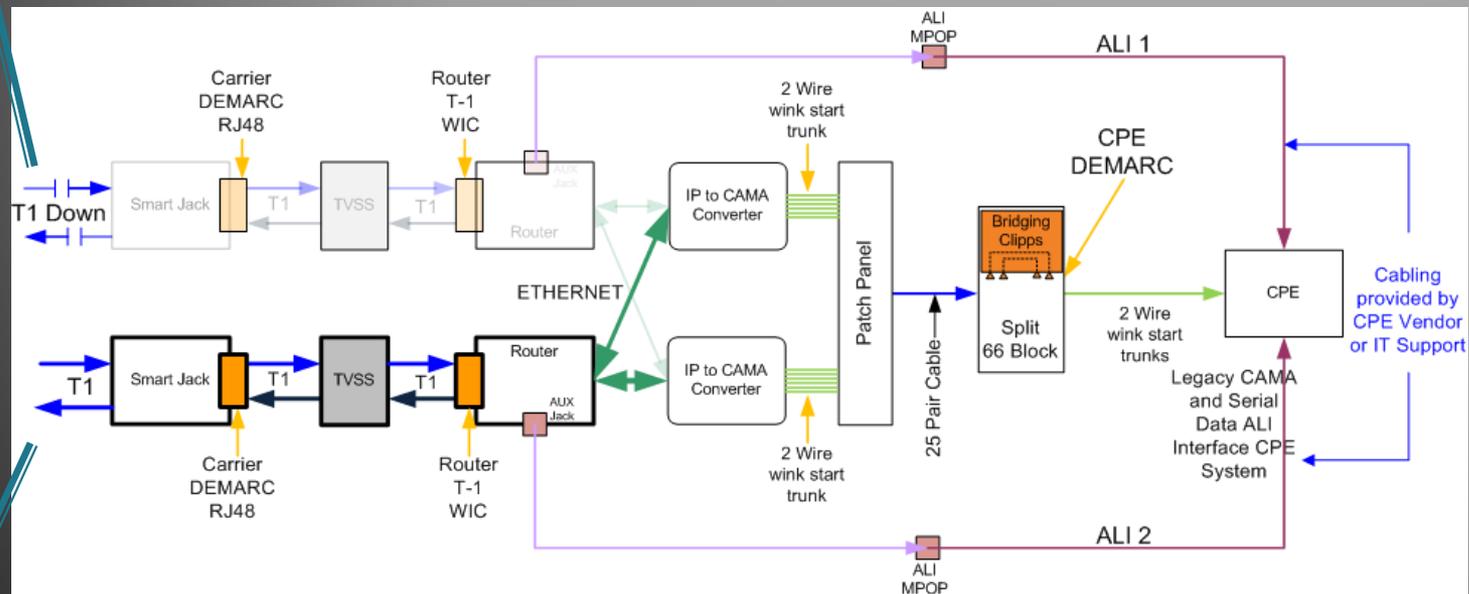
Field Support Covers Whole State within 4 hour response Time with spare parts at 4 depots

Three of these depots cover the MESB area

Field Support Teams also make up the Install Teams

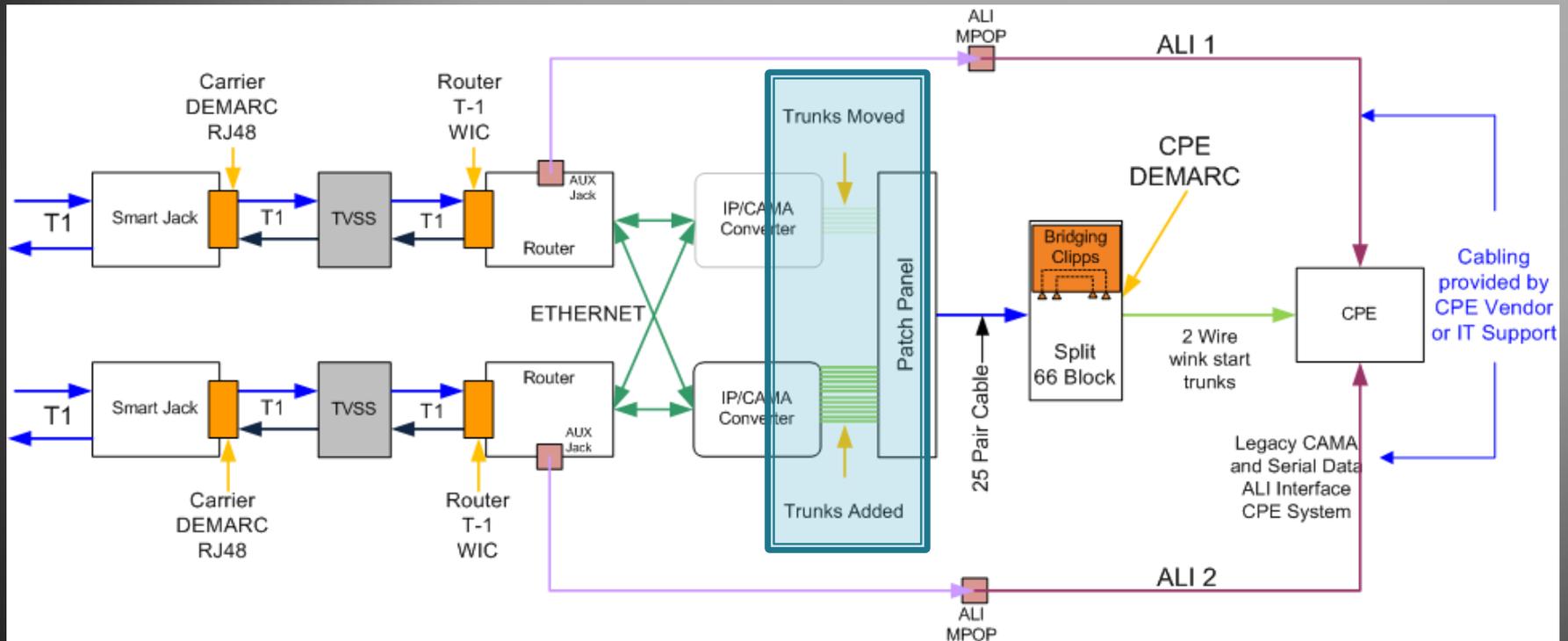
T1 Outage Resiliency

T1 Down



Other T1(s) configured to send all voice traffic; though ALI will remain one-sided until T1 restored

Gateway Equipment Failure Addressed by Support Team



- Gateway Equipment will be replaced by Support team
- Support Team may move trunks initially to functioning equipment if needed for minimizing disruption.

Function of Change R (FOCR)

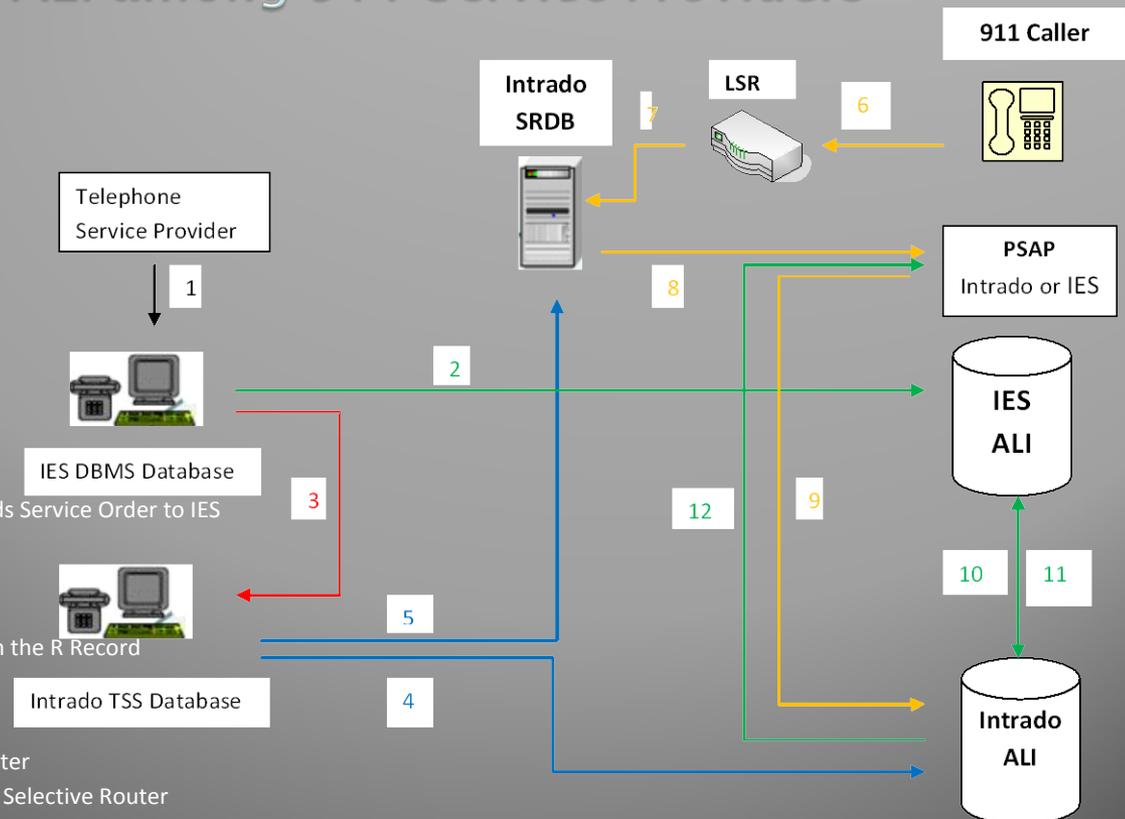
Uniting the routing and ALI among 911 Service Providers

Provisioning R Records

1. Telephone Service Provider (TSP) servicing an IES area sends Service Order to IES
2. IES updates IES ALI
3. IES generates R Records and submits them to Intrado
4. Intrado ALI is updated with the R Record
5. The Intrado SRDB is updated with routing information from the R Record

9-1-1 Call Utilizing R Record

6. A 9-1-1 Call is placed, and sent to the Legacy Selective Router
7. The Legacy Selective Router delivers the call to the Intrado Selective Router
8. The Intrado Selective Router accesses the Intrado Selective Router Database (SRDB), which contains the information provisioned in step 5, for routing instructions. The Intrado SR routes the call to the correct PSAP.
9. The PSAP receives the voice call and ANI and places a bid to the Intrado ALI
10. Intrado ALI accesses the R Record and uses the IES ALI System Identifier on the R Record provisioned in step 4 to steer the bid to IES ALI
11. IES ALI returns the Location and ESN information from their system to the Intrado ALI
12. Intrado ALI passes on the ALI and ESN information to the PSAP in the required PSAP format



Assumptions:

- IES has separate DBMS and ALI
- All PSAPs are connected to Intrado ALI

Migration Methodology

Survey

- Survey PSAP and CPE Vendor for equipment space, location, trunking, transfer codes

Determine PSAP Readiness & Design Circuits

- From Site Survey assess readiness needs and circuit sizing. Design diverse circuits with Customer Review

Install Circuits and PSAP Equipment

- Provision Circuits, prep PSAP equipment and perform basic installation .

Conduct ALI Migration; Voice/Network Pre-Migration

- Perform several tests to identify and isolate potential issues when migrating
- If ALI is fully functional, leave up and running

Migrate

- Conduct and test, migration of voice and ALI data

Monitor

- Monitor in soak period, obtain customer acceptance

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Measure/Monitor Mean Optimum Score (MOS)



Device at PSAP (Tektronix PP30) used for MOS Score Calculation and other quality measurements.



Active Testing Device (Tektronix PP600)
Makes and Measures Test Calls to PSAP

Example MOS readout
(For Phase 1 Network)



Measure / Monitor

From Device: USA MI CHASKA 600 E 4TH ST : 63.233.45.154
Selected To Device: USA CO ENGLEWOOD 391 INVERNESS PKWY : 63.235.15.6 (COLORADO_LINK)

Select a path for active metrics

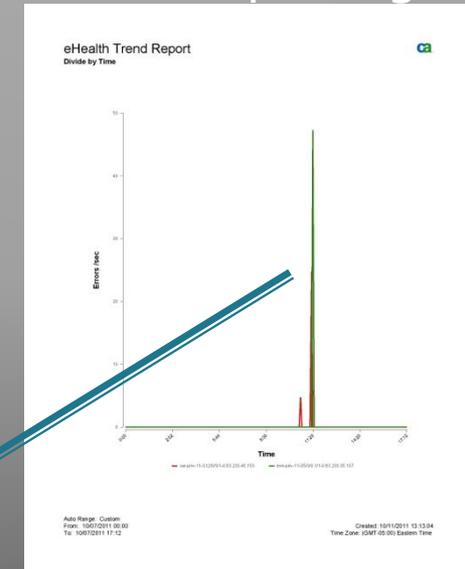
Type	From	To
E2E	XXXXXXXXXX	XXXXXXXXXX
P2P	XXXXXXXXXX	XXXXXXXXXX
P2P	CER-PRIV-11	HLR-NSSP-01
P2P	HLR-NSSP-01	XXXXXXXXXX

Select a device for passive metrics

Device	Type	Location
63.233.45.154	CE	CHASKA, MI USA
CER-PRIV-11	PE	CHICAGO, IL USA
HLR-NSSP-01	PE	HIGHLANDS RANCH, CO USA



Service Manager Leon Jagim has access to network reporting tools



Spike -when network was down at Carver for TVSS installation

In addition, Network Operations Center has several monitoring tools For supporting Next Gen

Migration of PSAPs Schedule

- ▶ Migration of PSAPs by Legacy Selective Router
- ▶ Alternate by CenturyLink and IES Routers
- ▶ Schedule to commence upon acceptance of Phase II PSAPs

911 Plan Change Letter

- ❑ PSAPs connecting to the State NG911 network will be required to submit a 911 Plan Change Letter to the State.
- ❑ The State will be providing a draft letter to the PSAPS and will be coordinating this effort.
- ❑ The signed 911 Plan Change Letters will need to be submitted to the State prior to conducting the PSAP survey.

Installation Guide

- ❑ Installation guides will be provided to the PSAPs during the PSAP survey process.
- ❑ An Installation Guide review meeting will be scheduled with the PSAP following the survey process.

Contacts

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