ALASKA DEPARTMENT OF ADMINISTRATION
TELECOMMUNICATION & BROADBAND

Presentation to

House Finance Subcommittee

February 13, 2014

Commissioner Curtis W. Thayer
Deputy Comm. Mike Barnhill
ETS Director Jim Bates

ALASKA LAND MOBILE RADIO (ALMR) UPDATE

ALMR – FUNDING AND FED RECEIPTS

- Non-DoD Feds $84,000
- DoD (paid direct contractors) $233,000
- DoD (paid direct to state) $54,000
- On-Behalf Munis / NGOs $500,000
- Maintenance and operations $3,939,600

(M&O is SATS and ALMR funds)

Governor Budget Request - No new funding for FY15

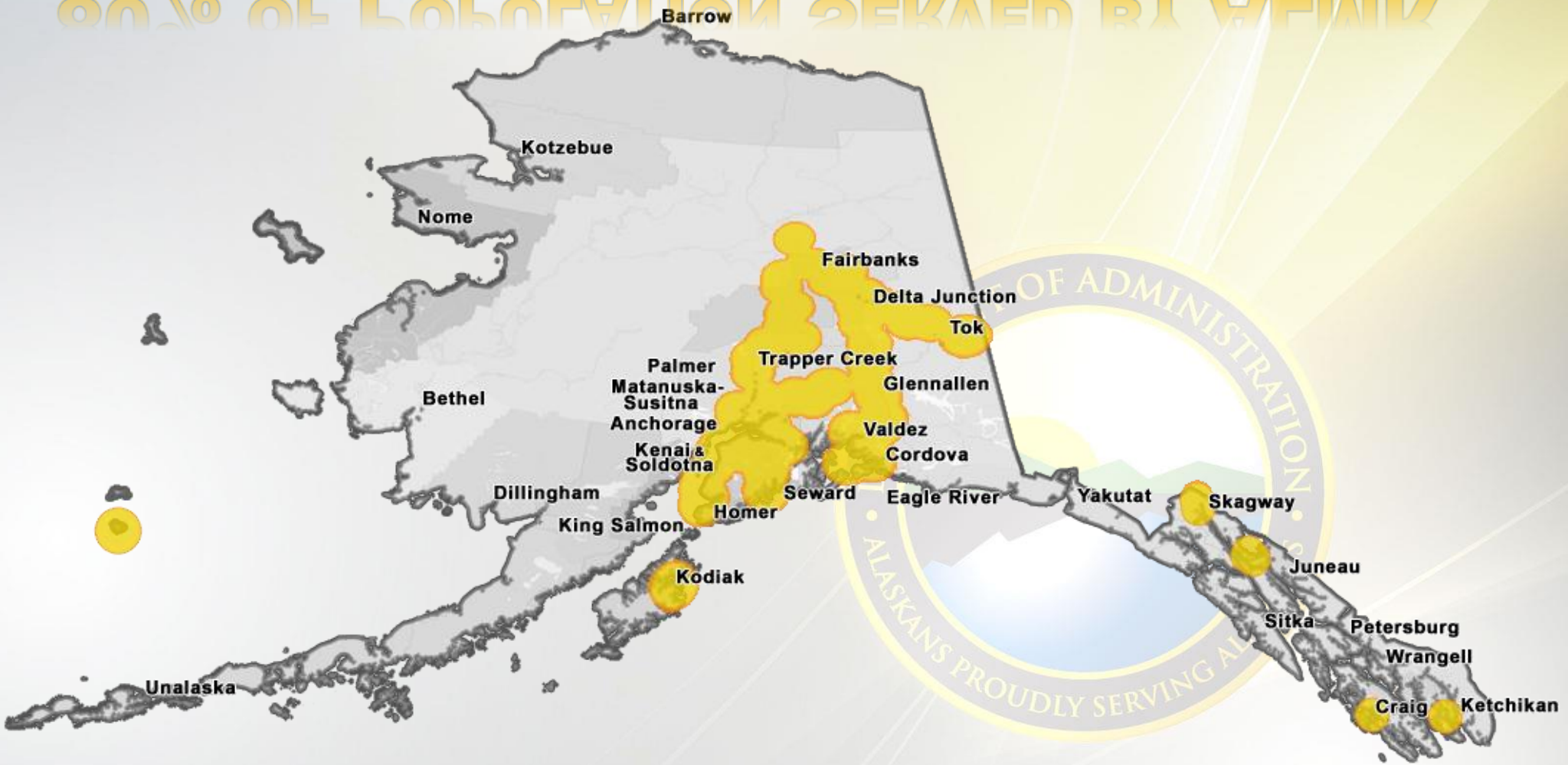
OVERVIEW OF ALASKA LAND MOBILE RADIO (ALMR)

ALMR is a 24-7-365 communications system, providing public safety radio communications in Alaska

- Daily operations, DPS, DOT, municipalities, others
- Interoperable emergency use across multiple users and organizations
- Secure, cost-effective communications
- Compliance with FCC and other requirements, such as
  - Narrowbanding
  - Statute, security
  - Multi-frequency waiver
- Lowest cost among alternatives to meet day-to-day needs
- 26,235 2-way radios (including 16,535 ALMR handsets)

ALMR COVERAGE

80% of Population Served by ALMR



WHO USES ALASKA LAND MOBILE RADIO?

Typical Users

- Department of Public Safety (Alaska State Troopers)
- Department of Natural Resources (fire season)
- Department of Transportation
- US Bureau of Land Management
- Anchorage Municipal Light and Power
- Fairbanks Fire Department
- Northstar Volunteer Fire Department
- Manley Volunteer Fire Department
- Providence Seward Medical & Care Center
- Mt. Sanford Tribal Consortium
- Central Peninsula Hospital
- Delta Rescue Squad (Delta Junction)

TOTAL NUMBER OF ALMR USERS

USERS	SUBSCRIBER UNITS (SUs)*
State of Alaska	6,325
Department of Defense (DOD)	6,977
Federal Non-DOD	848
Municipalities and NGOs**	7,968
Total SUs	**18,988**

** Subscriber Units (SUs) include Handsets (portables) and Vehicle-mounted Sets (mobiles); totals as of December 31, 2013*

*** Non-Governmental Organizations (NGOs)*

WHAT IF…

Widespread natural or manmade disaster affects a large portion of our state and citizens?

With Alaska Land Mobile Radio (ALMR):

- Different organizations and first responders can coordinate during a large-scale disaster with true incident command.

Without ALMR:

- Public safety loses the ability to warn the public, evacuate populations, guide/direct first responders, coordinate disaster recovery efforts and prevent or minimize loss of life and property.

OWNERSHIP OF ALASKA LAND MOBILE RADIO

We own/share it now

- US Department of Defense (DoD) paid 60%-70% of original capital investment
- Alaska Land Mobile Radio (ALMR) current operating cost are similar to comparable state-only system
- Similar state-only system would require significant capital outlay and would not reduce operating costs compared to ALMR – just to achieve the same functionality as the current system

RURAL BROADBAND UPDATE

GEOGRAPHIC DISTRIBUTION OF SOA STAFFING AND LOCATIONS

Location	Percentage of Staff	Number of Locations
JNU-ANC-FAI	80.00%	204 locations
Kenai-Soldotna-Kodiak	5.00%	58 locations
Palmer-Wasilla – Ea. River	5.00%	35 locations
On the "Road System" inc. SE	5.00%	92 locations
Isolated: served via Satellite	5.00%	81 locations
	TOTAL: 100.00%	**TOTAL: 470 locations**

Source: November 2010 ETS data

STATE BANDWIDTH ACROSS ALASKA

State of Alaska - Bandwidth & Distributed Services Matrix

Legend

- > 100 mbps
- > 3 mbps
- < 3mpbs
- < 1 mbps
- < 1 mbps/high latency

Opportunities

SATS

No Chargeback but ETS pays $3 million annually.

Customer / Service Demographics							
		Calendar Year (CY) 2013				Goal	CY 2014 Notes
Location	Estimated Customers	Bandwidth per User (mbps)	Current Bandwidth (mbps)	Avg Latency (ms)	Satellite Services	Target Bandwidth	Updates
Anchorage	6055	0.050	300.000	23			Optimization Core Site
Juneau	5151	0.058	300.000	23			Optimization Core Site
Fairbanks	2911	0.015	45.000	14			Optimization Core Site
Palmer	548	0.018	10.000	3			
Bethel	400	0.019	7.650	611	X	8 mbps	Site for Optimization & TERRA Broadband Pilots. Results indicate the State can replace the 7 bonded circuits and with a single 3mbps TERRA circuit paired with Optimization appliances (hardware software) and achieve better performance.
Kenai	383	0.026	10.000	11			Optimization Pilot Site
Wasilla	366	0.027	10.000	4			
Kodiak	315	0.032	10.000	37			
Ketchikan	313	0.064	20.000	6		40 mbps (award)	Upgrade Complete - 40mbps
Elmendorf AFB	243	0.006	1.500				
Eagle River	213	0.014	3.000	30			
Sitka	207	0.007	1.500	64		10 mbps	Upgraded Complete - 20mbps
Douglas	190	0.105	20.000	3			
Soldotna	186	0.242	45.000	5			
Homer	106	0.094	10.000	5			
Seward	105	0.190	20.000	9			
Delta Junction	81	0.037	3.000	36			
Dillingham	76	0.006	0.448	3005	X	3 mbps	Bid Complete / Cost Concerns / Optimization Pilot Site
Valdez	68	0.044	3.000	34		3 mbps (diverse)	
Cordova	60	0.050	3.000	46			
Petersburg	59	0.012	0.704	28		5 mbps (award)	Upgrade Complete - 5mbps
Glennallen	49	0.031	1.500	30			
Tok	37	0.081	3.000	40			
Haines	37	0.041	1.500	208		5 mbps (award)	Upgrade Complete - 5mbps
Nome	32	0.028	0.896	978	X	3 mbps	Bid Complete / Cost Concerns / Optimization Pilot Site
Kotzebue	30	0.026	0.768	29	X	4.5 mbps	Bid Complete / Cost Concerns / Optimization Pilot Site
Dutch Harbor	29	0.009	0.256	574	X	1.5 mbps	Bid Complete / Cost Concerns / Optimization Pilot Site
Fort Richardson	26	0.058	1.500				
King Salmon	21	0.037	0.768	573	X	1.5 mbps	Bid Complete / Cost Concerns
Craig	19	0.027	0.512	13		3 mbps (award)	Upgrade Compete - 3mbps
Fort Wainwright	18	0.556	10.000				
Auke Bay	18	0.167	3.000				
Skagway	15	0.021	0.320	4		1.5 mbps (award)	Upgrade Complete - 1.5 mbps
Wrangell	15	0.043	0.640	10		3 mbps (award)	Upgrade Complete - 3mbps
McGrath	14	0.107	1.500	570	X	3 mbps	
Barrow	12	0.059	0.704	604	X	1.5 mbps	
Yakutat	11	0.023	0.256	566	X	1.5 mbps	
Klawock	11	0.051	0.560			1.5 mbps	
TOTAL	18430						

RURAL BANDWIDTH ACCELERATION

Rural Bandwidth Acceleration Pilot Program

- **Proof of Concept - The project tested the combination of architectural changes to optimize traffic for the Dillingham and Bethel offices.**
- The testing showed using Optimization Appliances (combination of hardware and software) ETS was able to provide an average of 20-40% reduction or compression of network traffic.
- **Pilot Program -** The pilot is deploying technology to Dillingham, Bethel, Kotzebue, and Dutch Harbor as the initial remote locations which will be activated.

RURAL BANDWIDTH ACCELERATION

Bethel Dual-Pilot

- In Bethel ETS has been testing the use of WAN optimization appliances and the new GCI TERRA offering. Test data indicates that the State may be able to replace the 7 bonded Satellite circuits with a hybrid Optimization/TERRA approach.
- Through testing - users have reported as a “night and day improvement”.

RURAL BANDWIDTH ACCELERATION

Department Application Changes

- ETS has worked with one agency and was able to identify an application issue as the cause of slow performance and not network congestion.
- We are continuing to look for ways to gain visibility and collaboration to help find other issues such as this which may contribute to a bad user experience that are not directly related to network performance.

QUINTILLION – EXPANDED COVERAGE

Network Overview

- **Scope:** $620 million subsea cable project from Tokyo to London through the lower Northwest Passage that provides both transoceanic and domestic connectivity
- **International:** Landings at Ajigaura, Japan and Highbridge, England with opportunity for separate branches into Cork, Ireland and Tomakomai, Japan
  - Trans-Pacific Route Tokyo to Seattle in consideration and would provide lowest latency route across the Pacific
- **Arctic North America:** Phase I
  - Alaska spurs: Prudhoe Bay, Barrow, Wainwright, Pt Hope, Kotzebue and Nome. Shemya subject to Federal Govt. approval. Unalaska under consideration for construction with trans-Pacific route.
  - Nunavut, Canada spurs: Cambridge Bay, Gjoa Haven, Taloyoak, Cape Dorset, Hall Beach, Igloolik and Iqaluit

QUINTILLION – EXPANDED COVERAGE

Network Overview, continued

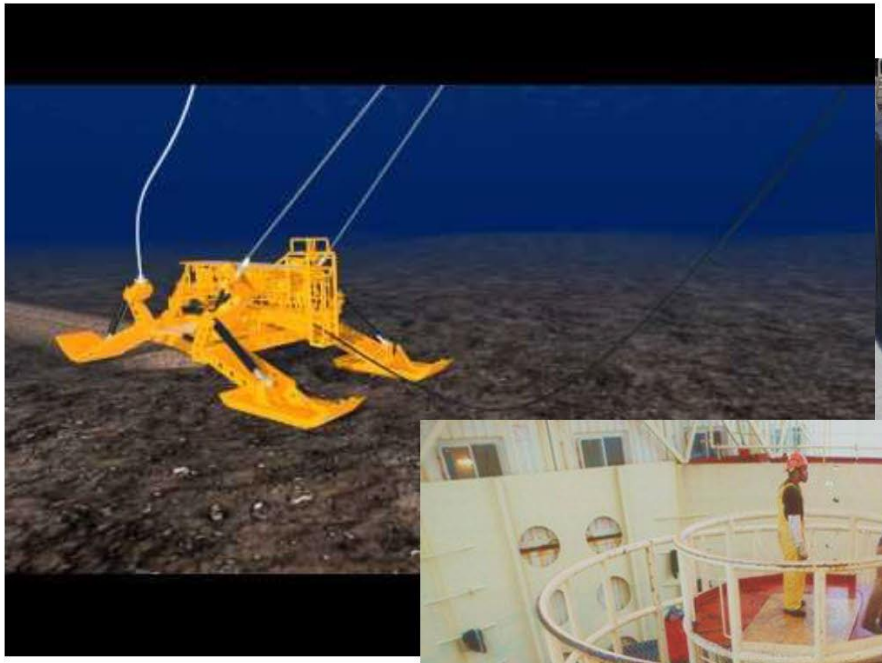
- **In Service Dates:** Arctic Alaska and Canada Q1 2016; International Q3 2016
- **International Demand Drivers:**
  - Physically diverse route from Europe to Asia
  - Avoids physical trouble spots – fish trawling, anchorage
  - Two fibre pairs avoid USA landings
  - Avoids politically risky areas – Egypt terrestrial crossing
  - Reduces network congestion in NY/NJ cable stations
  - Lowest latency route from Tokyo to London (153 ms)
  - Measurable ROI from ULL routes for financials and Internet companies
- **Arctic Demand Drivers:**
  - Most Arctic communities in Canada and Alaska are dependent on high-cost satellite
  - Fixed wireless options often cost as much or more than satellite with limited capacity
  - Economic and resource development constrained by lack of true high-speed, affordable broadband

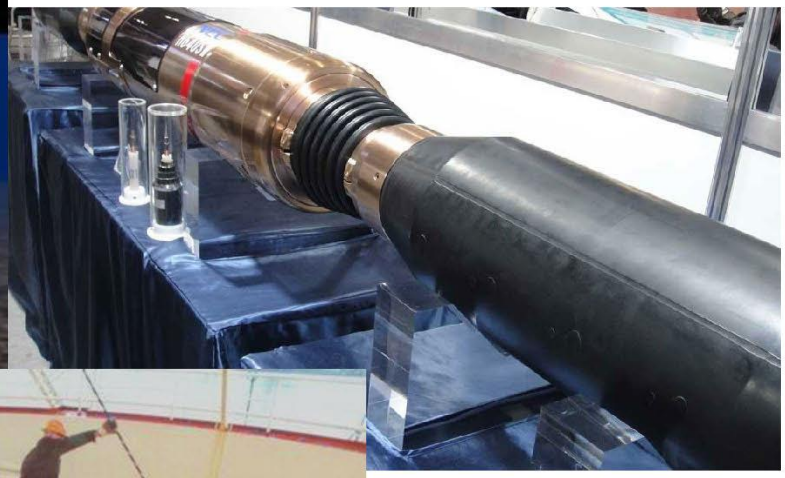
QUINTILLION – EXPANDED COVERAGE

How Alaska Benefits

- UNDERSERVED
- URBAN COMPARABILITY
- AFFORDABILITY
- EDUCATION
- HEALTH CARE
- GOVERNMENT
- ECONOMIC DEVELOPMENT
- EMERGENCY RESPONSE
- PUBLIC SAFETY

QUINTILLION – EXPANDED COVERAGE





QUINTILLION – EXPANDED COVERAGE

Lower Costs Improve Affordability

- Joint build with Arctic Fibre provides substantial capital cost reduction
- Industry cooperation reduces overhead and avoids duplicate costs: collocation of landing sites with existing COs, outsourced O&M to local providers provides faster response times
- Substantially lower cost of operation than microwave or satellite
- Competition on product, price and service at user interface instead of on backhaul
- Provides more affordable base for connecting neighboring communities
- Design creates a redundant ring around Alaska

Quintillion is committed to pricing that spurs broadband at rates substantially lower than current services in rural Alaska!

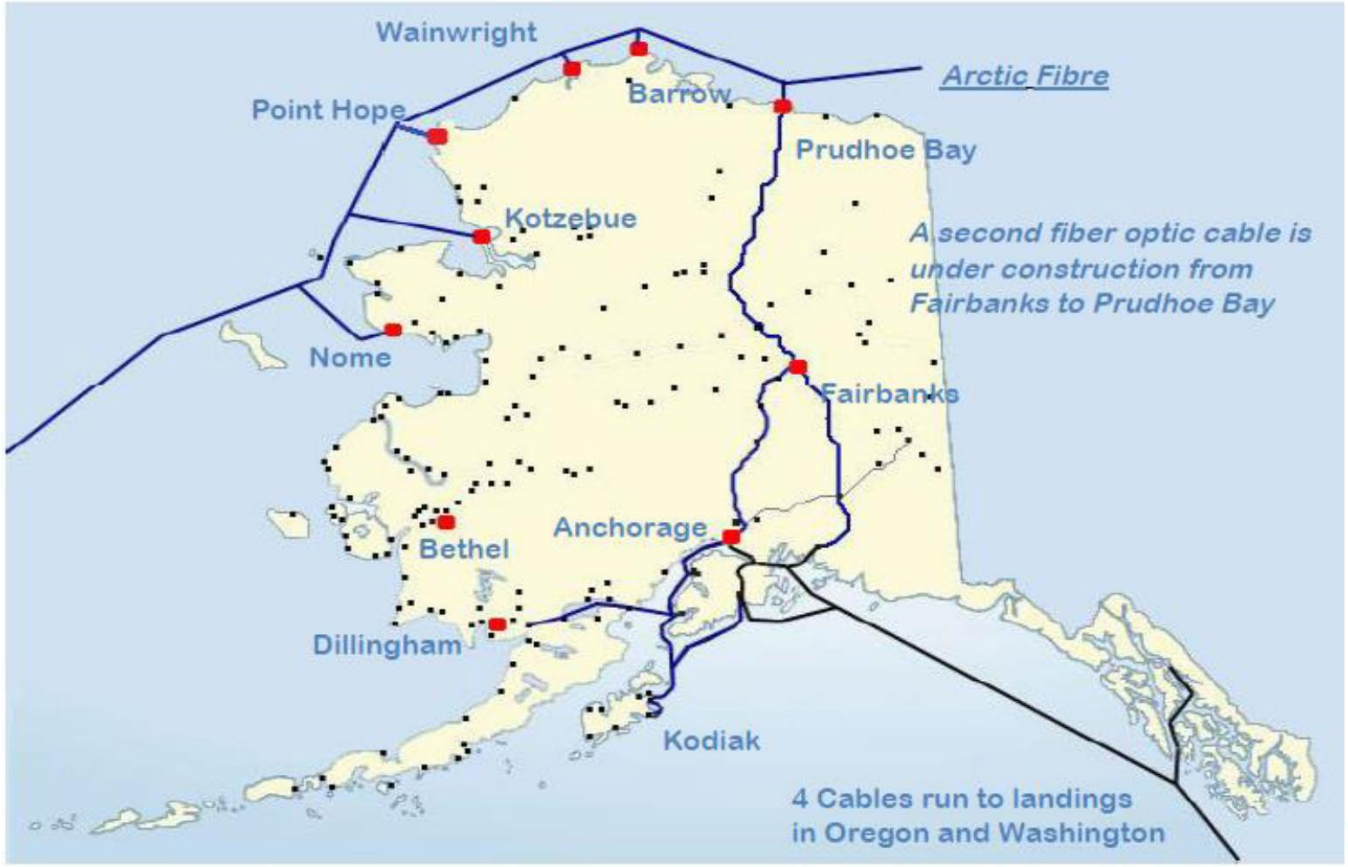
QUINTILLION – EXPANDED COVERAGE

Quintillion Networks – 100G Network

- Quintillion Networks will add new broadband capacity with subsea fiber optic cable builds to Phase I Alaska Landing Sites:
  - Funded Landings: Nome, Kotzebue, Point Hope, Wainwright, Barrow, & Prudhoe Bay
  - Under Consideration Landings: Unalaska and Shemya
- Day 1 Deployment to deliver up to 100 Gbps per landing
- The Alaska Middle Mile Network landscape will change:
  - Significant price reduction to last mile providers in affected markets
  - Middle mile open to all service providers encourages competition on product, price and service at the last mile
  - Provides real broadband to currently under and un-served areas

QUINTILLION – EXPANDED COVERAGE

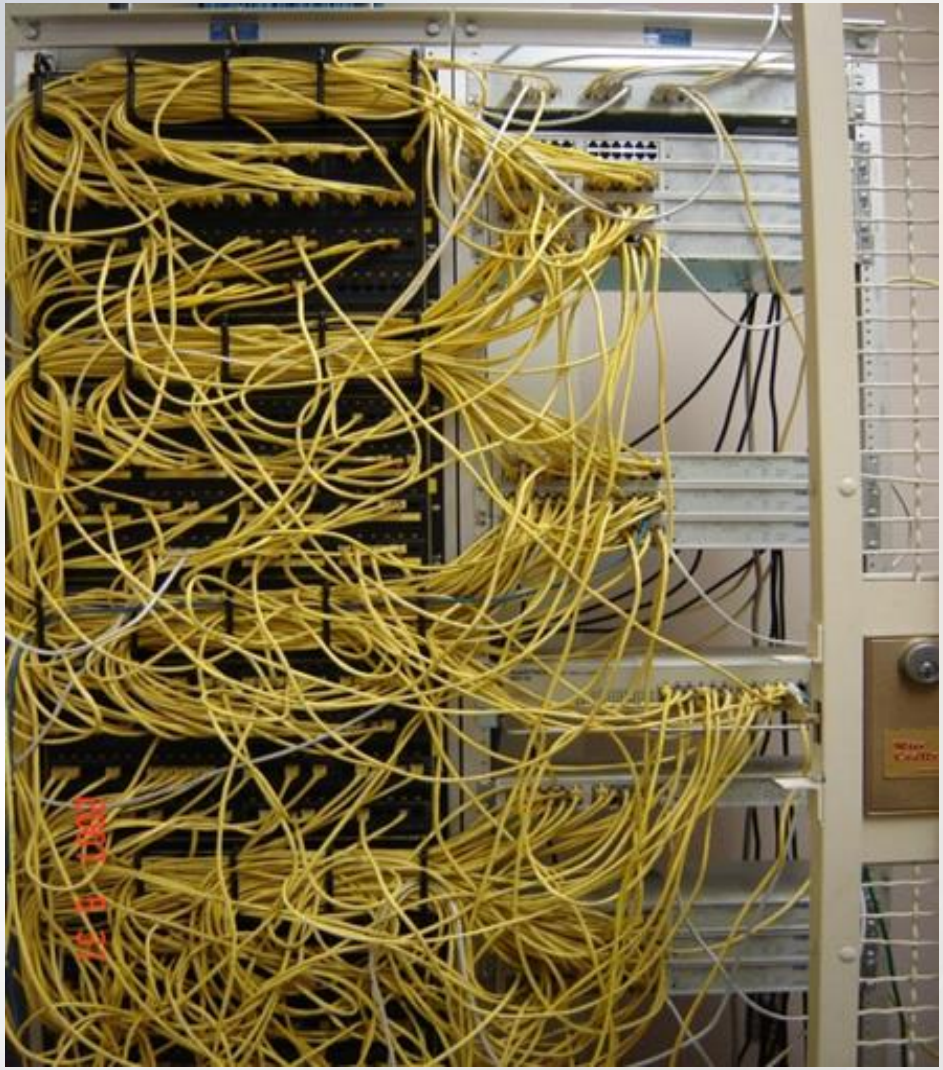
Reach of FOC in Alaska substantially improved: Map of all FOC by 2016



QUINTILLION NETWORKS

STRATEGIC IT PLANNING

SADC – STATE CLOUD



THEN

and

NOW

STATE CLOUD

What it is:

Private Cloud Server Hosting is a method of partitioning a physical computer into multiple servers. These “servers” can then be provisioned for customers for their private use. To the customer, it appears as a dedicated server, but it is actually a virtual server housed among many on one large computer.

Key Features:

- Delivered or removed on demand
- Customer only pays for what they want, when they want it
- Scalable
- The customer pays for only the resources they require and use
- Reduced cost through economies of scale
- Secure and includes Disaster Recovery

What it is not:

- Legacy Systems (Mainframe)
- Applications

STATE CLOUD – SECURE, MULTI-TENANT

- Hot and cold aisle technology
- Redundant Power, Cooling, and UPS (Battery) backup
- Lights out remote management
- Secure
- Quicker deploy times
- Cost Savings
- Faster speed to the WAN

STATE CLOUD CUSTOMERS

- ETS currently hosts over 650 virtual servers located throughout Anchorage, Juneau, and Fairbanks.
- Division of Finance for its IRIS System: 27 virtual servers.
- Department of Health and Social Services for its ARIES System: 22 virtual servers in Phase 1, and another 22 in Phase 2.
- ETS for Messaging and Directory Services: 86 highly customized servers, with 165TB of storage.
- Department of Revenue for its TRMS System: 20 virtual servers.

STATE CLOUD - SERVICES

Managed:

- Our Managed Hosting offering allows the customer to focus on the application and service delivery.
- In this model, ETS is responsible for the entire infrastructure up through the operating systems (OS).
- This includes network, server, storage maintenance and licensing, OS management, security, overall system backup/restore, and disaster recovery.
- This is provided on our Secure Multi-Tenant State Cloud offering.

STATE CLOUD - SERVICES

Un-Managed:

- In our Un-Managed Hosting offering, ETS is responsible for the infrastructure up to the hardware that supports the customer's system.
- The customer is responsible for the OS and any hosted applications or services deployed on those systems.
- In this model, ETS support includes network, server, storage maintenance, and licensing. It does not include OS management, support, and security.
- The overall system backup/restore, and disaster recovery roles are defined in the detailed SLA with the customer.

ENTERPRISE SOFTWARE

- ETS is helping State Agencies reduce cost and maintenance by leveraging Enterprise licensing
  - Email
  - VMWare
  - Microsoft

BANDWIDTH

- Rural bandwidth is very expensive; 75% of the bandwidth budget is rural long haul
- Likely to be 3-5 years before rural private wan circuits, primarily Terra, will be competitive
- Could partner with municipal, federal, courts, university organizations
- Average 10% increase per year traffic increase affecting mostly long haul (between cities) & internet pipes
- managing traffic growth with filtering, caching & optimization
- New Alaskan technology solutions with likely cost reductions from providers
- Session Initiation protocol - IP networking for phone traffic (replace caller ID PRI lines - $800 MRC)

SATS - 101

- State of Alaska Telecommunication System
- Approximately 150 communication sites
- Variegated transport methods
  - Terrestrial microwave
  - Fiber optic cabling
  - Copper wire
  - Two-way radio
  - Satellite links

SATS - 101

- The overall System is owned by the State and managed by ETS
  - Comprised of over 12,000 separate pieces of communication equipment
  - Equipment ownership includes State allies and Federal agencies
- Backbone of the State Wide Area Network (WAN) and Public Safety communication system.

SATS - SERVICES

- Voice traffic – telephones
- Data traffic – WAN
- Seismic equipment and data transport
- SCADA equipment and data – Four Dam Pool support
- Differential GPS equipment and data
- Conventional 2-way radio (non-ALMR)
- Trunked 2-way radio (ALMR)
- Video Conferencing
- Highway emergency call-boxes
- Paging
- Alaska Rural Communications System (RATNET – Satellite TV)
- Railroad collision avoidance

SATS - CUSTOMERS

State Agencies

- DPS – AST – Public Safety
- ARR – Alaska Railroad Operations
- DOT Highway maintenance and operations
- DEC Environmental Conservation
- DNR – Forestry and Parks (Forest Fires)
- DOC – Corrections
- DMVA – Homeland security and emergency communications
- DHSS – Emergency Medical Services, Pioneer Homes, Juvenile Justice
- Alaska Energy Authority

SATS - CUSTOMERS

Non-State Agencies

- Federal
  - DHS – Homeland security
  - DoD – Defense
  - FBI – Investigations
  - Secret Service
- Municipal
  - Police
  - Fire
  - Health and Safety
- Utilities
  - Power plants
  - Hydroelectric dam

Thank you!

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for more information about our department.

Questions?