MARSHALL ISLANDS NATIONAL TELECOMMUNICATIONS AUTHORITY

Country Report on IP/ISP Network

by

Amata Kabua II

I.T. Dept

- Managing/Configuring/Installing/Monitoring/Troubleshooting/Maintaining:
  - miNTA Backbone Network
  - miNTA Services
  - Virtual Machines (VMWare)- Servers
  - External Tech Support
  - Support Accounting System
  - Internal Tech Support

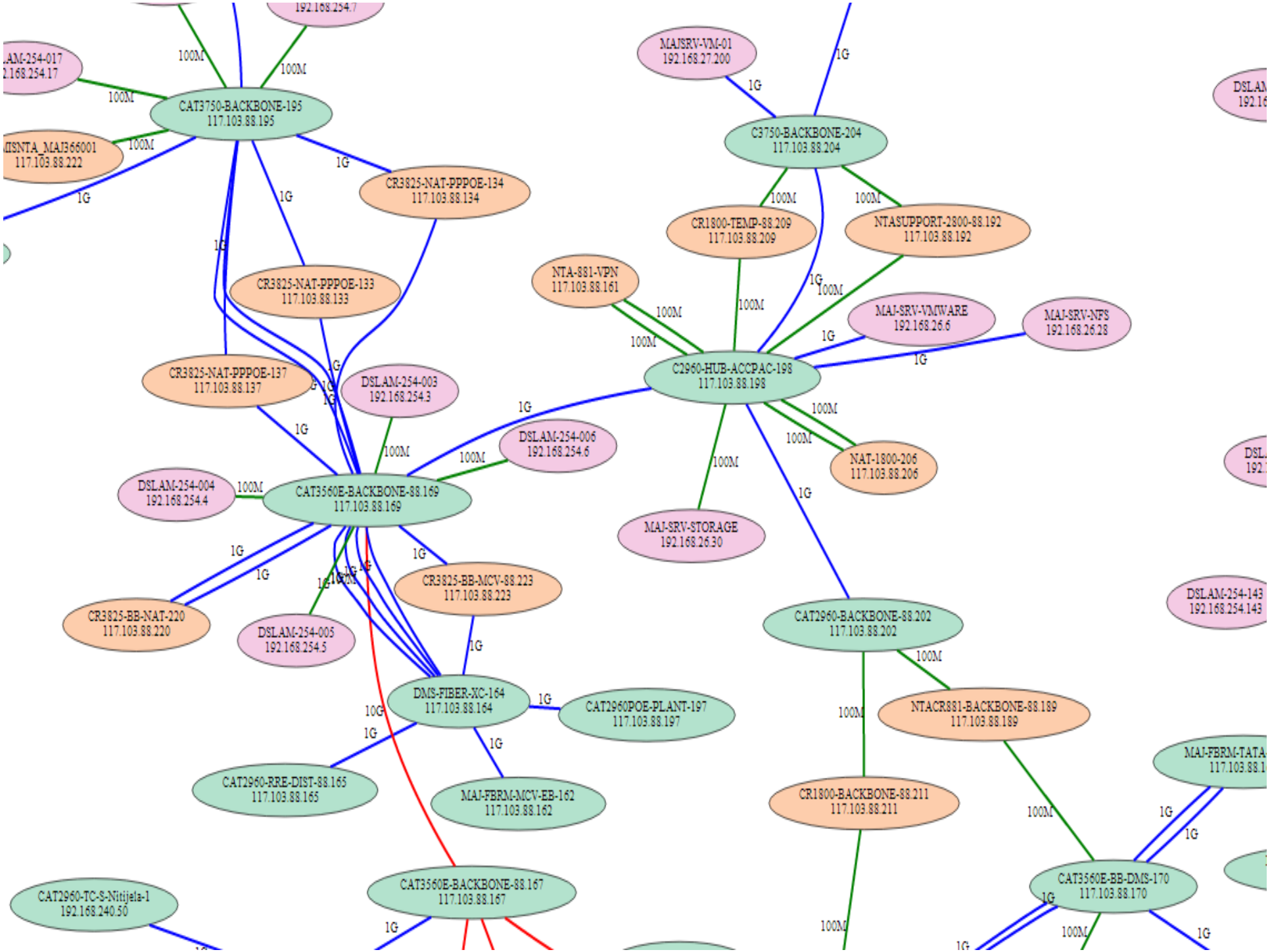
miNTA's Network

- Backbone consists of 90+ switches, storage medias and routers:
  - Majuro and Ebeye backbone switches (Cisco)
  - Network Address Translators (NAT) routers (Cisco)
  - Network Attached Storage (NAS)- Synology
  - ACCPAC- Accting Server (Sun Server)
  - GSM Network
  - DSLAMs- ADSL and Leased Lines; Zhone and Calix
  - Ubiquiti (Rockets, NanoStations, Access Points)- Hot Spots

National Telecommunications Authority
NTA
Marshall Islands

miNTA Internet Services

- Internet- High Speed DSL, email, VoIP, Hot Spots
- Mobile/Cell Phones
- DAMA- Demand Assigned Multiple Access Satellite System
- Cable TV- Streaming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AM-254-017
2.168.254.17
CAT3750-BACKBONE-195
117.103.88.195
ISNTA_MAJ366001
117.103.88.222
CR3825-NAT-PPPOE-134
117.103.88.134
CR3825-NAT-PPPOE-133
117.103.88.133
CR3825-NAT-PPPOE-137
117.103.88.137
DSLAM-254-003
192.168.254.3
DSLAM-254-006
192.168.254.6
DSLAM-254-004
192.168.254.4
CAT3560E-BACKBONE-88.169
117.103.88.169
CR3825-BB-MCV-88.223
117.103.88.223
CR3825-BB-NAT-220
117.103.88.220
DSLAM-254-005
192.168.254.5
DMS-FIBER-XC-164
117.103.88.164
CAT2960POE-PLANT-197
117.103.88.197
CAT2960-RRE-DIST-88.165
117.103.88.165
MAJ-FBRM-MCV-EB-162
117.103.88.162
CAT3560E-BACKBONE-88.167
117.103.88.167
CAT2960-TC-S-Nitijela-1
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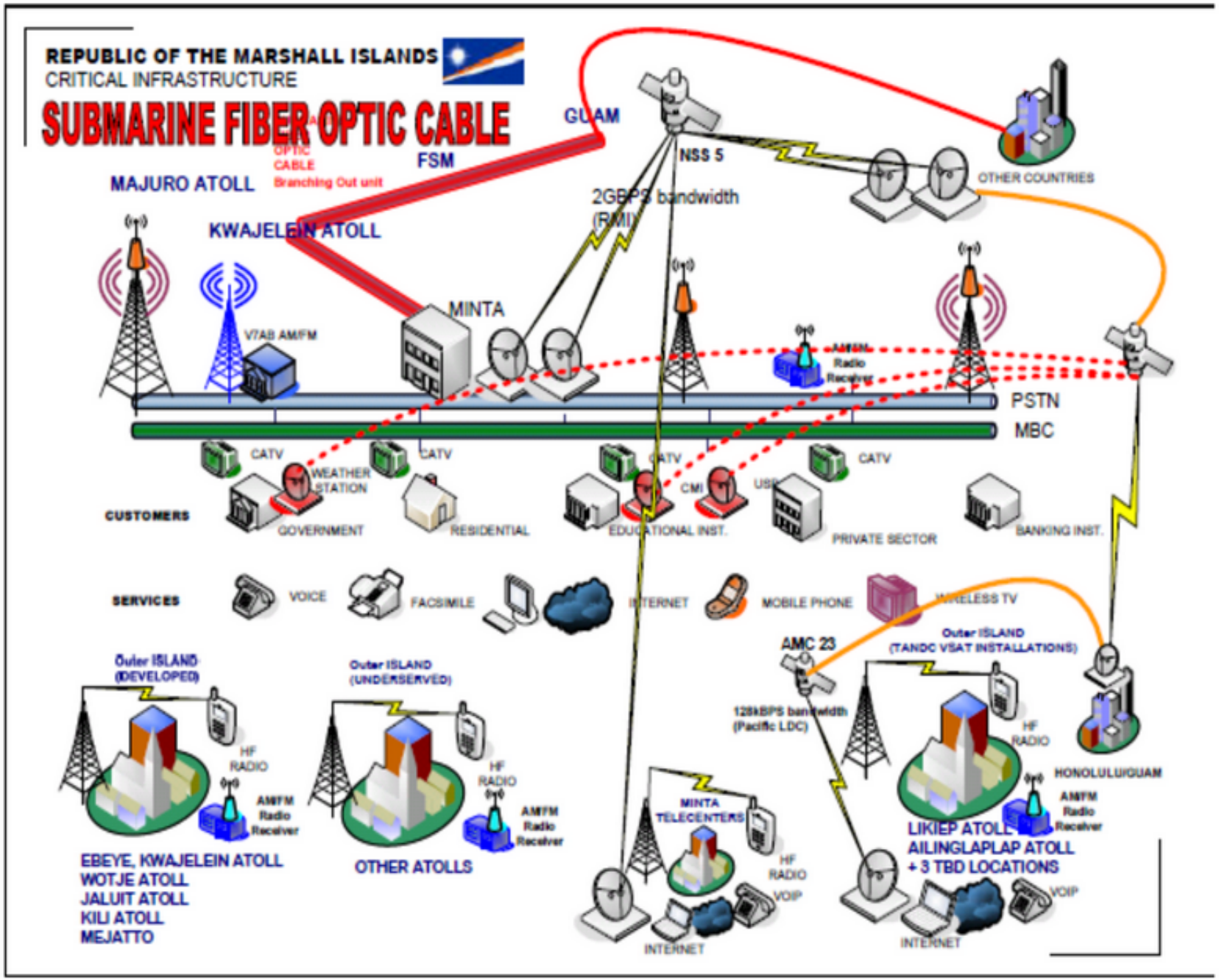
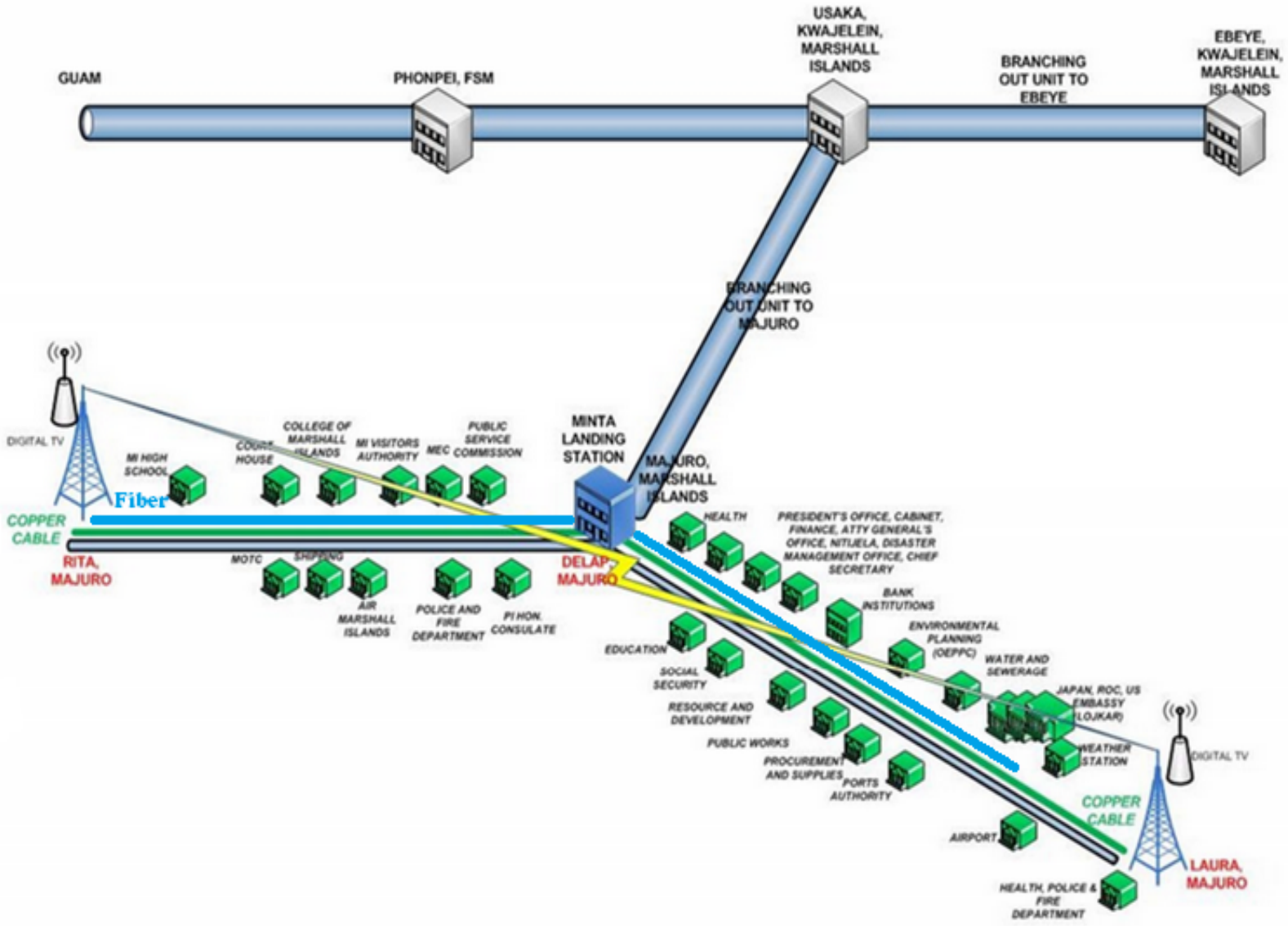
MAJSRV-VM-01
192.168.27.200
C3750-BACKBONE-204
117.103.88.204
CR1800-TEMP-88.209
117.103.88.209
NTASUPPORT-2800-88.192
117.103.88.192
NTA-881-VPN
117.103.88.161
MAJ-SRV-VMWARE
192.168.26.6
MAJ-SRV-NFS
192.168.26.28
C2960-HUB-ACCPAC-198
117.103.88.198
NAT-1800-206
117.103.88.206
MAJ-SRV-STORAGE
192.168.26.30
CAT2960-BACKBONE-88.202
117.103.88.202
NTACR881-BACKBONE-88.189
117.103.88.189
CR1800-BACKBONE-88.211
117.103.88.211
CAT3560E-BB-DMS-170
117.103.88.170
DSLAM-254-143
192.168.254.143
100M
1G
10G

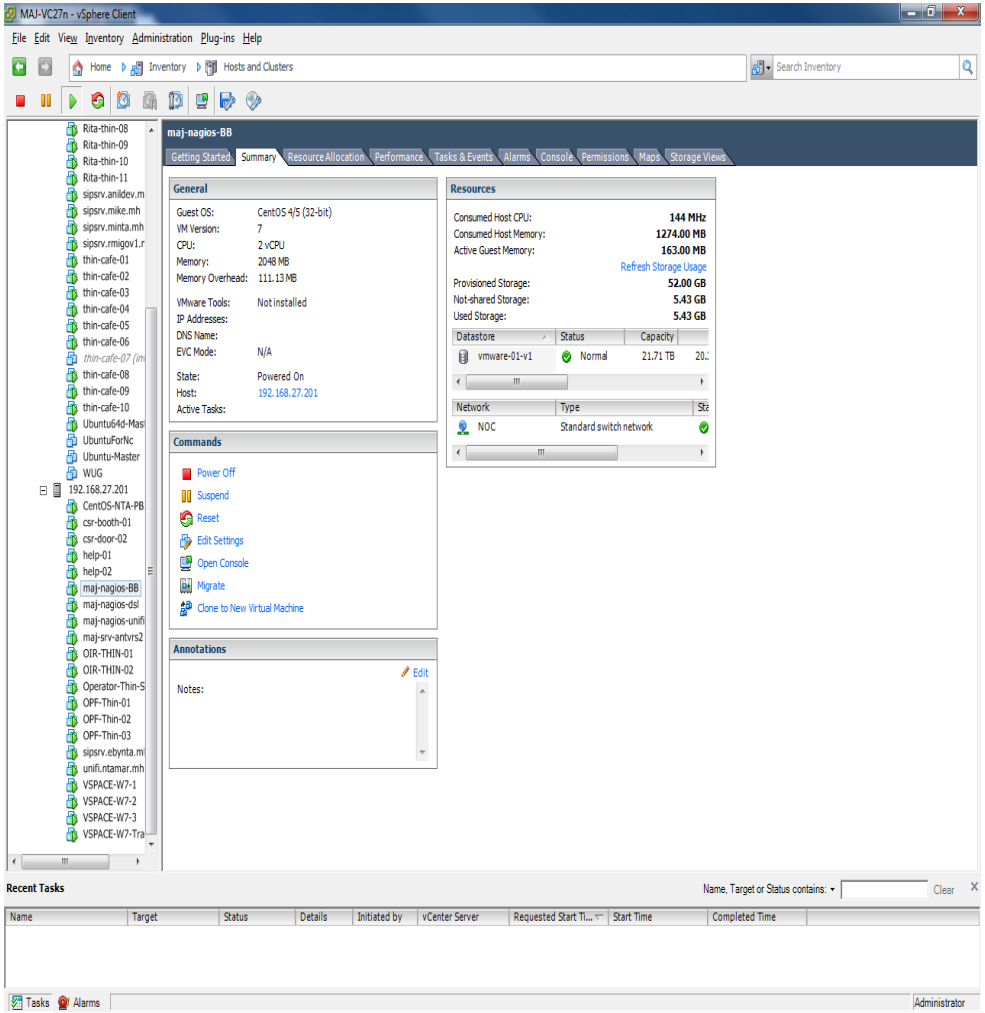

REPUBLIC OF THE MARSHALL ISLANDS
CRITICAL INFRASTRUCTURE
SUBMARINE FIBER OPTIC CABLE
GUAM
FSM
OPTIC CABLE
Branching Out unit
MAJURO ATOLL
KWAJELEIN ATOLL
NSS 5
OTHER COUNTRIES
2GBPS bandwidth (RMI)
MINTA
V7AB AM/FM
AM/FM Radio Receiver
PSTN
MBC
CATV
WEATHER STATION
CMI
USP
CUSTOMERS
GOVERNMENT
RESIDENTIAL
EDUCATIONAL INST.
PRIVATE SECTOR
BANKING INST.
SERVICES
VOICE
FACSIMILE
INTERNET
MOBILE PHONE
WIRELESS TV
AMC 23
Outer ISLAND (TANDC VSAT INSTALLATIONS)
128kBPS bandwidth (Pacific LDC)
Outer ISLAND (DEVELOPED)
Outer ISLAND (UNDERSERVED)
HF RADIO
AM/FM Radio Receiver
HONOLULU/GUAM
MINTA TELECENTERS
VOIP
EBEYE, KWAJELEIN ATOLL
WOTJE ATOLL
JALUIT ATOLL
KILI ATOLL
MEJATTO
OTHER ATOLLS
LIKIEP ATOLL
AILINGLAPLAP ATOLL
+ 3 TBD LOCATIONS

RMI Submarine Fiber Optic Cable connectivity diagram

RMI Submarine Fiber Optic Cable Connectivity Diagram



miNTA Virtual Machines: VMWare



- Houses Servers for:
  - miNTA's AD, Anti-Virus, VPN, Call-Booth, etc.
  - VoIP Services
  - Thin Clients
  - Monitoring System:
    - WUG
    - Cacti
    - SPAM
    - WhatsUpGold
    - Nagios
    - UniFi Controller

Internet Services

- Leased Line
- ADSL
- DAMA Satellite- Outer Islands
- UniFi- Sputnik (WiFi) for Hot Spots
- Air Fiber
- VoIP

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Leased Line/ADSL

Currently utilising 1.2 gb of 8 gb available;

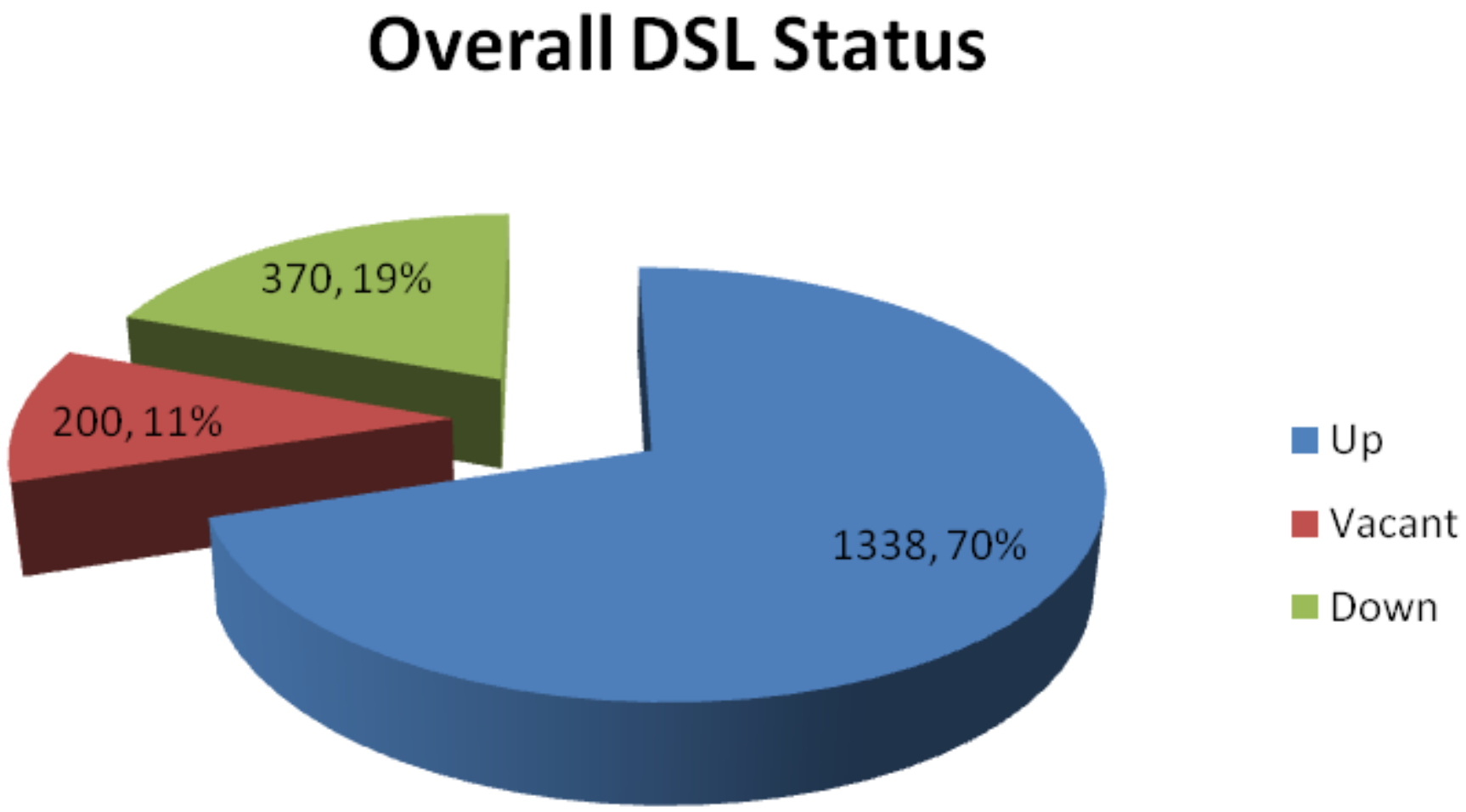
Leased Line-Gov't/Bus

- 11 BitStorm
  - situated mostly in HQ
  - 360 total ports with 204 (57%) down/unused

ADSL-Residents

- no more kbps (1, 3 and 5 mbps)
- 33 Raptors with 48 ports;
- 2 Calix with 48 ports;
- 7 distribution sites

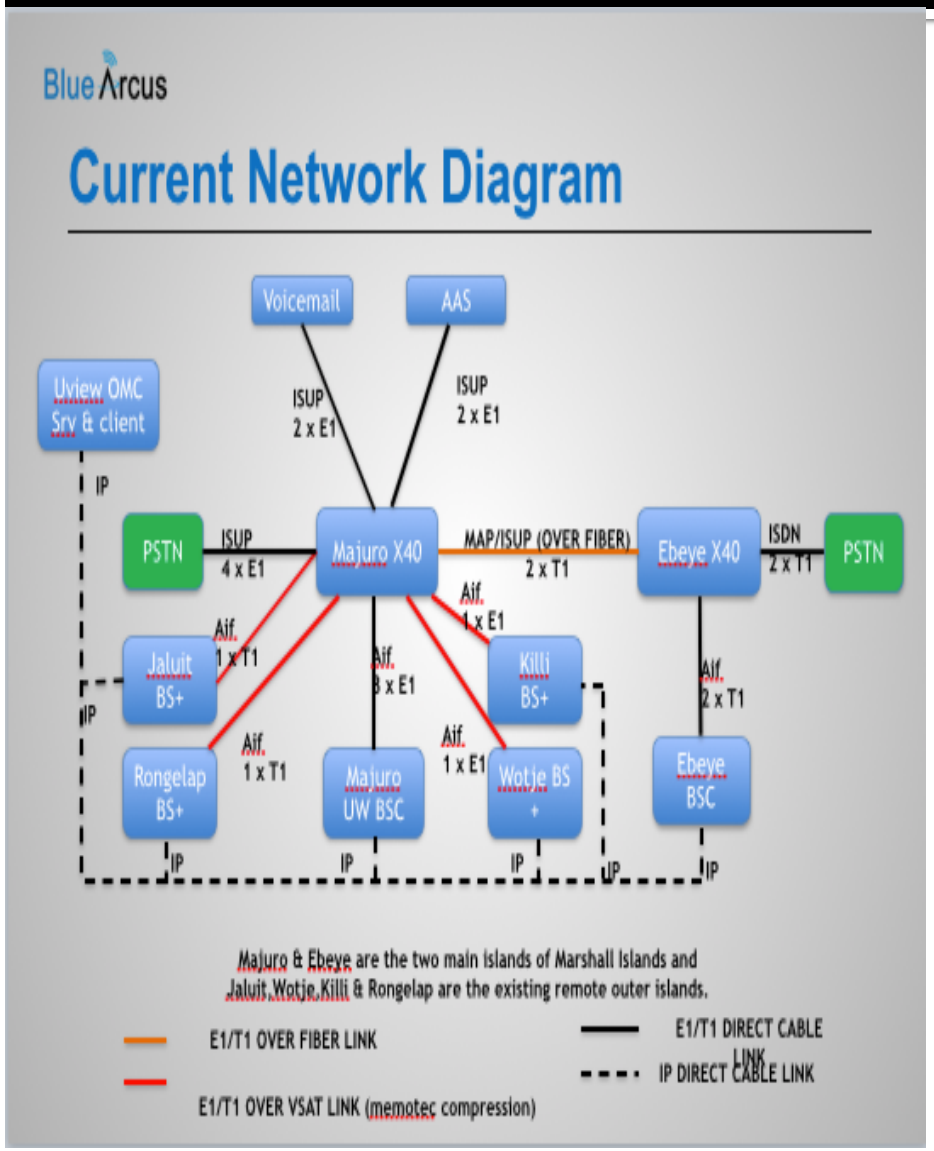
Overall DSL Port Status

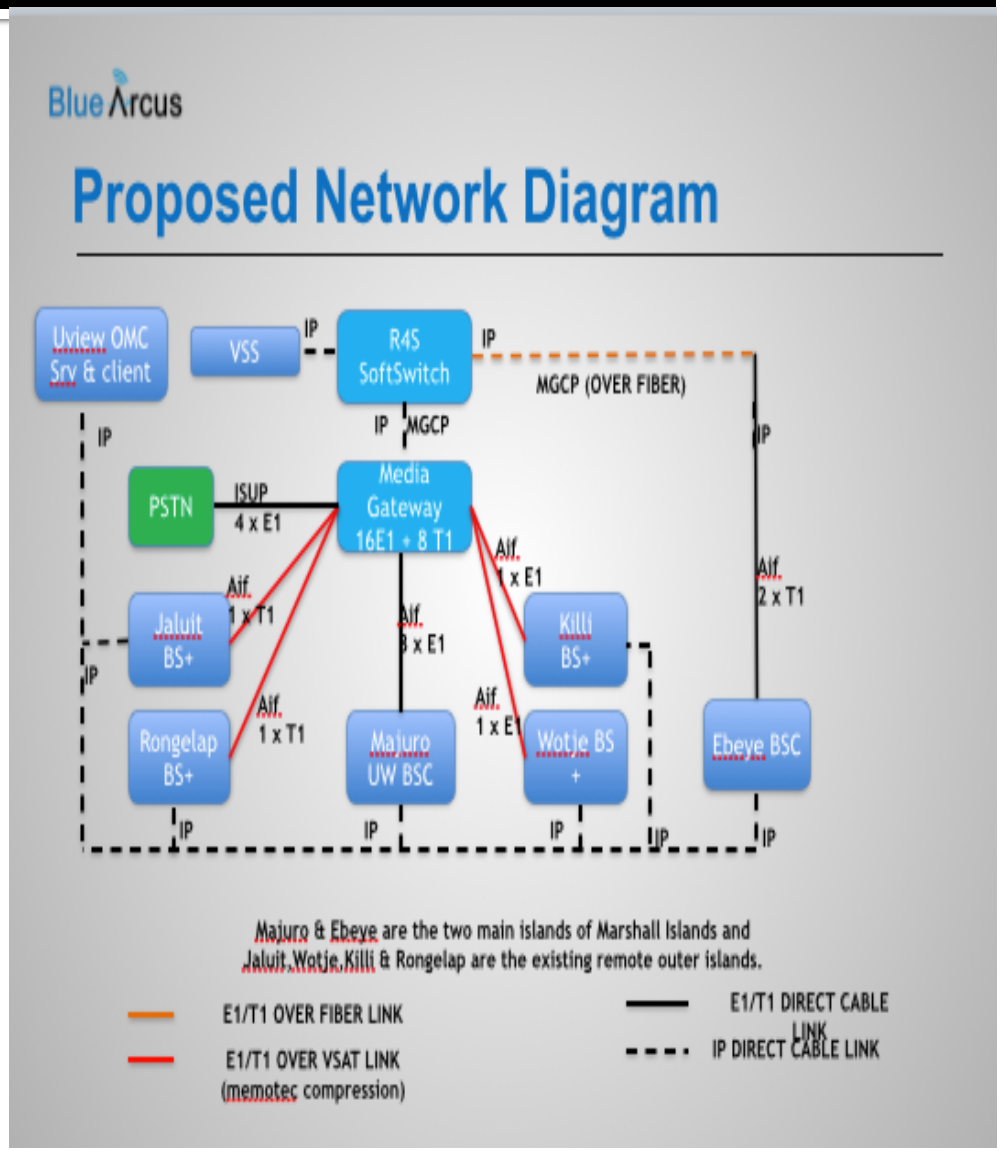


GSM-Mobile Service

- currently only Voice & SMS are the main services offered;
- Servicing over 21,000+ mobile users
  - Majuro, Ebeye, Kili, Wotje, Jaluit, Rongelap
- upgrading from X40 circuit switch to R4S soft switch; centralise system
- moving from 2.5G to GPRS/EDGE; not quite 3G

GSM-Upgrade


BlueArcus
Current Network Diagram
Voicemail
AAS
Uview OMC Srv & client
ISUP 2 x E1
ISUP 2 x E1
IP
PSTN
ISUP 4 x E1
Majuro X40
MAP/ISUP (OVER FIBER) 2 x T1
Ebeye X40
ISDN 2 x T1
PSTN
Aif. 1 x T1
Aif. 1 x E1
Jaluit BS+
Aif. 3 x E1
Killi BS+
Aif. 2 x T1
Aif. 1 x T1
Aif. 1 x E1
Rongelap BS+
Majuro UW BSC
Wotje BS +
Ebeye BSC
IP
Majuro & Ebeye are the two main islands of Marshall Islands and
Jaluit,Wotje,Killi & Rongelap are the existing remote outer islands.
E1/T1 OVER FIBER LINK
E1/T1 OVER VSAT LINK (memotec compression)
E1/T1 DIRECT CABLE LINK
IP DIRECT CABLE LINK


BlueArcus
Proposed Network Diagram
Uview OMC Srv & client
VSS
IP
R4S SoftSwitch
IP
MGCP (OVER FIBER)
IP
MGCP
IP
PSTN
ISUP 4 x E1
Media Gateway 16E1 + 8 T1
Aif. 1 x E1
Aif. 2 x T1
Aif. 1 x T1
Jaluit BS+
Aif. 3 x E1
Killi BS+
Aif. 1 x T1
Aif. 1 x E1
Rongelap BS+
Majuro UW BSC
Wotje BS +
Ebeye BSC
IP
Majuro & Ebeye are the two main islands of Marshall Islands and
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E1/T1 OVER FIBER LINK
E1/T1 OVER VSAT LINK (memotec compression)
E1/T1 DIRECT CABLE LINK
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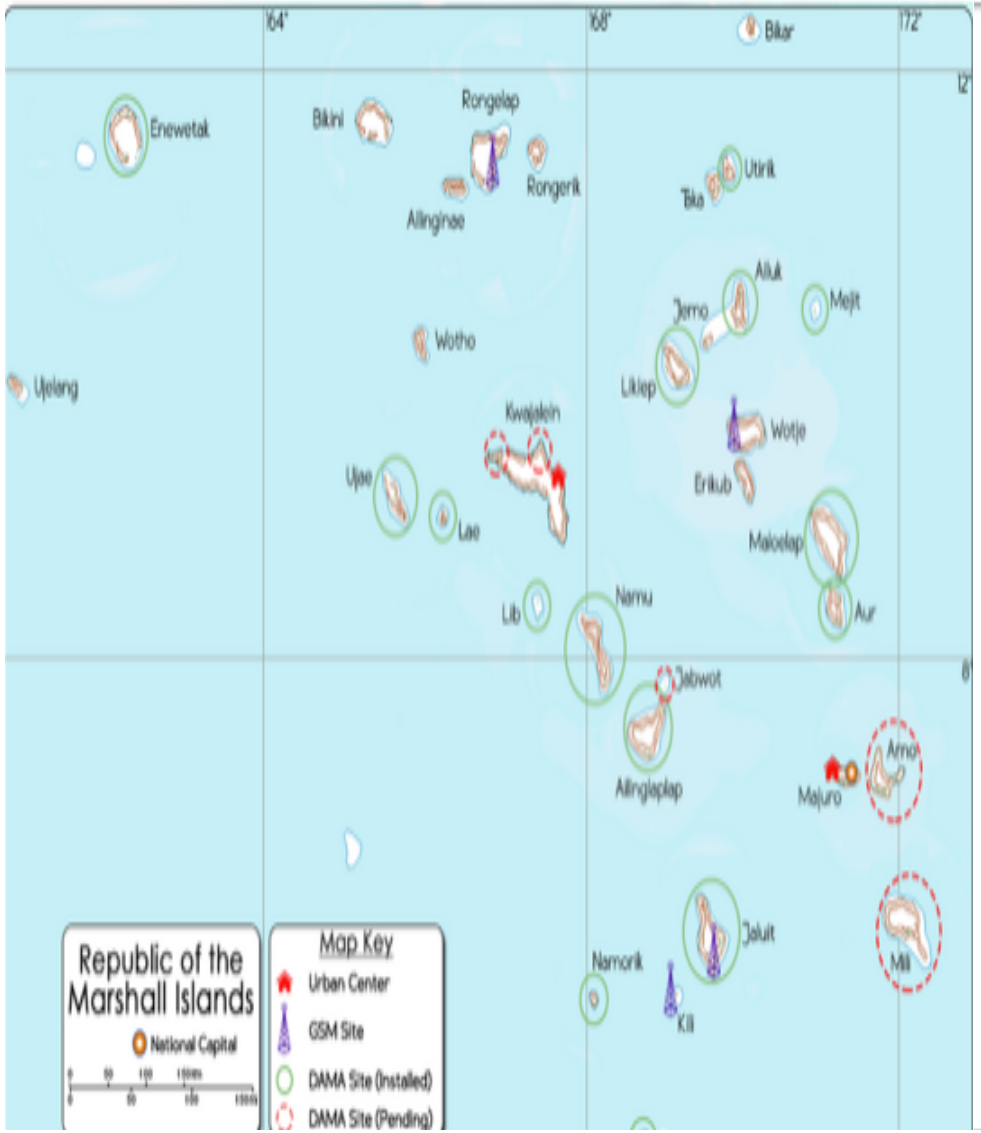
GSM-New Features

- SIP, Unstructured Supplementary Service Data (USSD) support
- FEP-Free Entry Prepaid; fully automated and eliminates need for roaming
- Pre-paid GPRS/EDGE services
- Virtual Calling/Data cards- Top up
- Balance transfer
- and many more….

DAMA Map



Project Commission Dates

1. Woja – Ailinglaplap - August 2011
2. Jeh – Ailinglaplap – August 2011
3. Beran – Ailinglaplap – August 2011
4. Bouj – Ailinglaplap – August 2011
5. Namu - August 2011
6. Utrik - September 2011
7. Likiep – September 2011
8. Namdrik - September 2011
9. Ebon - September 2011
10. Jaluit - November 2011
11. Lib Island - Dec. 2013
12. Ujae - Oct. 2012
13. Ailuk - Nov. 2012
14. Tarawa - Moloelap - Dec. 2013
15. Aerok – Moloelap - Dec. 2013
16. Mejit - June. 2012
17. Aur- Aur – Oct. 2012
18. Tobal - Aur – Oct.2012
19. Lae - Oct. 2012

Pending:
Wotho, Arno, Mili, Jabat, Santo, Mejjato

HOT Spots-UniFi/Sputnik

- available only in Majuro
- each Access Point up to 30 mbps
- Ultra WiFi
  - Laptops, Tablets, and Handheld devices (iPod, etc.)
- Handheld WiFi
- Hot Spots
  - 23 Coverage Areas including 4 of the islets

BOMI
DAR
RRE COMPOUND
ULIGA INN
AWA ZERO
RIWUT CORNER
JITTAKEN
NTA
ICC
DELAP PARK
MIR
MAKO BUILDING
BEST FOOD

On-going Projects

- Air Fiber link between atolls
- Introducing VoIP services into Market
- Dual Stacking edge routers- miNTA prepping for IPv6
- NOC
- build Hot Spots in Ebeye
- launching .mh and create a Data Center for hosting- miNTA to play both Registry and Registrar role?(pending Government election)
- update miNTA website-include customer portal
- introducing GPRS/EDGE service.

Challenges

- Backing up Fiber connection with Guam
  - ka-band Satellite System
  - O3b Satellite System
- Environment and unpredictable power outages
- Provide higher bandwidth for Outer Islands
- GSM blind spots
- Repairing main copper cable; troubleshooting Outer islands; raising employee capacity
- Keeping up with the demand for higher speeds
- Create more efficient Monitoring System
  - SPAM detection- 2 mail gateways compromised
  - User protection from hackers, bots, and other harmful programs; CMI network compromised