



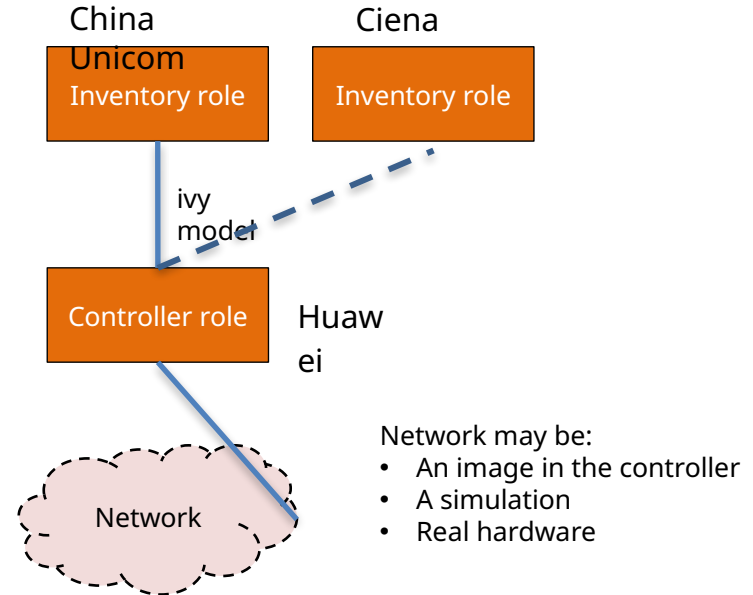
IETF Hackathon

-YANG Data Model for Network Inventory (IVY)

IETF 125
14–15 March 2026
Shenzhen, China

IVY YANG Model Interop Test

- Most likely testbed configuration:
 - A controller from one vendor plays the role of inventory system (inventory role)
 - Several controllers from different vendors are plays the role of inventory controller (controller role)
 - Each controller role provides a view of network elements and their physical inventory
- If a vendor has an inventory system, this can take the inventory role

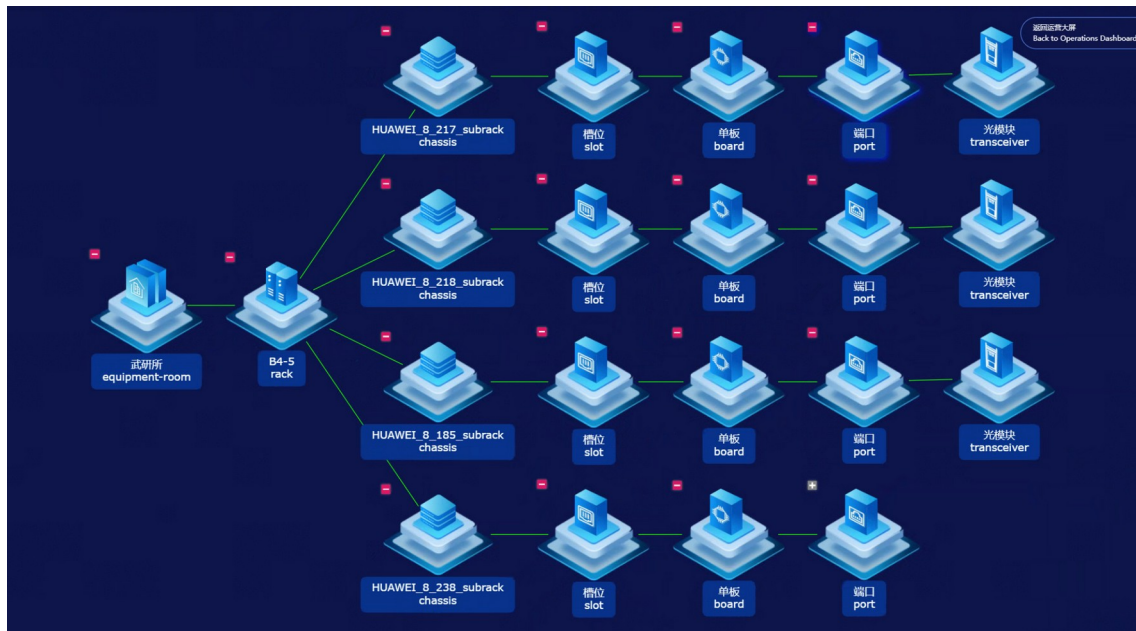


Ideally network elements would be a mix of IP, Ethernet, OTN and optical where there were various NEs of different mixes of capabilities. This should have no impact on the ivy interface capability.

Ivy model

```
module: ietf-network-hardware-inventory
  +--ro network-hardware-inventory
    +--ro network-elements
      +--ro network-element* [uuid]
        +--ro uuid          yang:uuid
        +--ro name?         string
        +--ro description?  string
        +--ro alias?        string
        +--ro hardware-rev? string
        +--ro software-rev? string
        +--ro mfg-name?     string
        +--ro mfg-date?    yang:date-and-time
        +--ro serial-number? string
        +--ro product-name? string
        +--ro components
          +--ro component* [uuid]
            +--ro uuid          yang:uuid
            +--ro name?         string
            +--ro description?  string
            +--ro alias?        string
            +--ro location?     string
            +--ro class?        dentityref
            +--ro parent-component-references
              | +--ro component-reference* [index]
              | | +--ro index      uint8
              | | +--ro class?    -> ../../../class
              | | +--ro uuid?     -> ../../../uuid
            +--ro hardware-rev? string
            +--ro firmware-rev? string
            +--ro software-rev? string
            +--ro serial-num?   string
            +--ro mfg-name?     string
```

- <What draft were involved?>
- draft-ietf-ccamp-network-inventory-yang-02



Ivy system(China Unicom Orchestrator)

The screenshot displays the Ivy system interface, which is used for managing network elements. The interface includes a sidebar with navigation options and a main content area with search filters and a data table.

Navigation Sidebar:

- 运营大屏 (Operations Dashboard)
- 资源视图 (Resource View)
- 资源管理 (Resource Management)
- 机房管理 (Equipment Room Management)
- 机架管理 (Rack Management)
- 网元管理 (Network Element Management)**
- 组件管理 (Component Management)

Search Filters:

- 网元名称 (Name): 请输入网元名称
- 厂家名称 (Mfg Name): 请输入厂家名称
- 主网关 (Primary Gateway): 是 否
- 网元网关 (Master Gateway): 请输入网元网关
- IPv4地址 (IPv4 Address): 请输入IPv4地址
- 产品类型 (Product Name): 请输入产品类型
- 重置 (Reset) | 搜索 (Search)

Data Table:

网元名称 (Name)	主网关 (Primary Gateway)	备用网关 (Backup Gateway)	产品类型 (Product Name)	IPv4地址 (IPv4 Address)	同步状态 (Sync Status)	管理状态 (Admin Status)	通信状态 (Communication Status)	操作 (Operate)
> HUAWEI_8_238	HUAWEI_8_238		OptiX OSN 9800 M12	9.173.8.238	synchronized	up	up	同步(Sync)
> HUAWEI_8_217	HUAWEI_8_217		OptiX OSN 9800 M24	9.173.8.217	synchronized	up	up	同步(Sync)
> HUAWEI_8_218	HUAWEI_8_218		OptiX OSN 9800 M24	9.173.8.218	synchronized	up	up	同步(Sync)
> HUAWEI_8_185	HUAWEI_8_185		OptiX OSN 9800 M12	9.173.8.185	synchronized	up	up	同步(Sync)

Page Navigation: 共 4 条 | 10条/页 | < 1 > | 前往 1 页

- 运营大屏
Operations Dashboard
- 资源视图
Resource View
- 资源管理
- 机房管理
Equipment Room Management
- 机架管理
Rack Management
- 网元管理
Network Element Management
- 组件管理
Component Management

组件类型(Type) 名称(Name) 生产厂家(Mfg Name) 网元(NE) 子架(Chassis)

















槽位(Slot)

名称(Name)	生产厂家(Mfg Name)	所属网元(Parent NE)	所属子架(Parent Chassis)	所属槽位(Parent Slot)	单板类型(Board Type)	单板状态(Board State)	子单板(Daughter Board)	工作模式(Work Mode)	描述(Description)	操作(Operate)
Shelf0-90-G1FAN	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-90	G1FAN	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
<p>功率均衡开关(Power Equalization) : disable 产品类型 (Product Name) : TNG1FAN (TNG1FAN01) BOM码(BOM Code): 2121961 条形码(Bar Code):</p> <p>期望单板类型(Expected Board Type): G1FAN FPGA版本(FPGA Version): 软件版本(Software Version): 硬件版本(Hardware Version): V</p> <p>固件版本(Firmware Version): 序列号(Serial Number): 2102121961N0JC00081 组件位置(Location): /ne=HUAWEI_8_238/sh=0/sl=90</p>										
> Shelf0-7-G2A212	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-7	G2A212	out-of-service	否	BD_MODE_GENERAL		同步(Sync) 明细(Detail)
> Shelf0-100-TMF1 PIU	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-100	TMF1PIU	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
> Shelf0-11-G3TMD20	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-11	G3TMD20	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
> Shelf0-74-E3CTU	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-74	E3CTU	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
> Shelf0-10-G3DAPXF	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-10	G3DAPXF	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
> Shelf0-101-TMF1 PIU	Huawei	HUAWEI_8_238	HUAWEI_8_238_subrack	Shelf0-101	TMF1PIU	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
> Shelf0-72-G3CXP	Huawei	HUAWEI_8_217	HUAWEI_8_217_subrack	Shelf0-72	G3CXP	out-of-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)
> Shelf0-9-S7N502	Huawei	HUAWEI_8_217	HUAWEI_8_217_subrack	Shelf0-9	S7N502	out-of-service	否	BD_MODE_LINE		同步(Sync) 明细(Detail)
> Shelf0-103-G1EFI	Huawei	HUAWEI_8_217	HUAWEI_8_217_subrack	Shelf0-103	G1EFI	in-service	否	BD_MODE_SDH_COMM ON		同步(Sync) 明细(Detail)

Video: <https://youtu.be/pli4L5IHZlk>

Ciena Results

- We received ivy conformant JSON in a file from the Hackathon
- We were able to take that and use our ivy mediation component (with a few refinements as we are using a different draft version) to extract the NE and equipment data and display it on the Navigator UI
- The following screenshot snips show that data
- This has been a very productive preparation for the planned hackathon in IETF 126

Name	Native name	Network element	Shelf	Slot	Serial #	Type	Part #	Hardware version
 HUAWEI_8_218_subrack-0 (t...	HUAWEI_8_218_subrack	HUAWEI_8_218	0		2102301267N0KB000125	OptiX OSN 9800 ...	OptiX OSN 9800 M24	OptiX OSN 9800 M24
 RX1/TX1-0-1 (type-sh-sl)	RX1/TX1	HUAWEI_8_218	0	1				
 IN1/OUT1-0-10 (type-sh-sl)	IN1/OUT1	HUAWEI_8_218	0	10				
 Shelf0-0-100 (type-sh-sl)	Shelf0-100-G2PIU	HUAWEI_8_218	0	100	024EPKWOKB001569	VER.B	VER.B	VER.B
 Shelf0-0-101 (type-sh-sl)	Shelf0-101-G2PIU	HUAWEI_8_218	0	101	024EPKWOKB001567	VER.B	VER.B	VER.B
 NMETH1/NMETH1-0-103 (ty...	NMETH1/NMETH1	HUAWEI_8_218	0	103				
 Shelf0-0-105 (type-sh-sl)	Shelf0-105-G2PIU	HUAWEI_8_218	0	105	024EPKWOKB001566	VER.B	VER.B	VER.B
 Shelf0-0-106 (type-sh-sl)	Shelf0-106-G2PIU	HUAWEI_8_218	0	106	024EPKWOKB001568	VER.B	VER.B	VER.B
 C_VO-0-13 (type-sh-sl)	C_VO	HUAWEI_8_218	0	13				
 NMETH1/NMETH1-0-71 (typ...	NMETH1/NMETH1	HUAWEI_8_218	0	71				
 ETH1/ETH1-0-72 (type-sh-sl)	ETH1/ETH1	HUAWEI_8_218	0	72				
 IN2/OUT2-0-8 (type-sh-sl)	IN2/OUT2	HUAWEI_8_218	0	8				
 RX30/TX30-0-9 (type-sh-sl)	RX30/TX30	HUAWEI_8_218	0	9				
 Shelf0-0-13 (type-sh-sl)	Shelf0-13-G6WDAPXF	HUAWEI_8_218	0	13				
 Shelf0-0-90 (type-sh-sl)	Shelf0-90-G1FAN	HUAWEI_8_218	0	90	2102121961N0KB000940	VER.B	VER.B	VER.B
 Shelf0-0-91 (type-sh-sl)	Shelf0-91-G1FAN	HUAWEI_8_218	0	91	2102121961N0KB000941	VER.B	VER.B	VER.B

		Connectivity							
<input type="checkbox"/>	Name	Network element	IP addr...	Management owner	Vendor	Type	Version	Device vers...	F...
<input type="checkbox"/>	Con... FS_JETF	Connected	10.123.1....	Navigator MC	Ciena	Controller-Navigator	TAPI 2.5.0		
<input type="checkbox"/>	Fore... HUAWEI_8_185			Navigator MC	Huawei	Foreign	V100R024C10SPC100	OptiX OSN 98...	
<input type="checkbox"/>	Fore... HUAWEI_8_217			Navigator MC	Huawei	Foreign	V100R024C10SPC100	OptiX OSN 98...	
<input type="checkbox"/>	Fore... HUAWEI_8_218			Navigator MC	Huawei	Foreign	V100R024C10SPC100	OptiX OSN 98...	
<input type="checkbox"/>	Fore... HUAWEI_8_238			Navigator MC	Huawei	Foreign	V100R024C10SPC100	OptiX OSN 98...	

For...
HUAWEI_8_185 | V100R024C10SPC100
Attributes

▼ Primary attributes

Name	HUAWEI_8_185
TID name	HUAWEI_8_185
Lifecycle	Discovered
Connectivity	—
Vendor	Huawei
Device type	OptiX OSN 9800 M12
Device version	OptiX OSN 9800 M12
Type	Foreign
IP address	—
MAC	—
Serial number	2102301555N0L8000789
Software type	V100R024C10SPC100
Software version	V100R024C10SPC100
Software image	—
Note	—

▼ Tags

HUAWEI_8_218 HUAWEI_8_218_subrack-0 (NE type-sh)

Attributes

Supports (0)

SRLGs (0)

▼ General

Name	HUAWEI_8_218_subrack-0
Native name	HUAWEI_8_218_subrack

Installed

Hardware version	OptiX OSN 9800 M24
Serial number	2102301267N0KB000125
Type	OptiX OSN 9800 M24
Part number	OptiX OSN 9800 M24
Version	OptiX OSN 9800 M24
Vendor name	Huawei

Provisioned

Hardware version	—
Serial number	—
Type	—
Part number	—
Version	—

Wrap Up

Team members:

Yanxia Tan(Chinaunicom)	Haomian Zheng(Huawei)
Italo Busi(Huawei)	Henry Yu(Huawei)
Xiao Li(Huawei)	Nigel Davis(Ciena)
Navin Purohit(Ciena)	Abhay
Sombanshi(Ciena)	
Yanlei Zheng(Chinaunicom)	Chaode Yu(Huawei)
Aihua Guo(Futurewei)	

First timers @ Hackathon:

Yanxia Tan
Xiao Li
Yanlei Zheng
Italo Busi

- On our github we have:
<https://github.com/tanyanxia/IETF125-Hackathon-ivy-project>
 - JSON code
 - Results presentation
- Full Video clip (7min):
<https://youtu.be/pli4L5lHzlk>
- Plan in Vienna (Hackathon IETF126)
 - Continue implementing the model from other vendors (interests collected)

Conclusions

- The base inventory model is mature
 - Adapting the old version with the new version required minimal efforts
- A follow-up Hackathon is planned at IETF 126
 - Interest being collected
 - On the agenda for the next weekly calls
 - Please contact Nigel Davis <ndavis@ciena.com>