AOS8 Migration Tool使用介绍

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2018/12/19

版本管理

版本号	介绍	备注
V1.0 – 2018-12-19	新建文档	测试版本：Migration Tool v3.2.3

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Migration Tools介绍

Controller从AOS6.x 升级到AOS8.x 过程中配置会被清空，需要在Mobility Master上重做整体配置，繁琐的升级过程，成为了众多工程师惧怕向客户推荐升级AOS8.x的原因之一

Migration Tools提供了一个GUI界面，支持AOS6.x到AOS8.x的自动升级以及从AOS8.x到AOS6.x的自动降级，降低了AOS8.x升级的复杂度

*仍建议工程师多累积手动配置AOS8.x的经验，过度依赖自动化不利于排障。
*使用Migration Tools做升级的过程中会造成无线业务中断

Migration Tools部分功能还不完善，并不能完全实现自动化，测试结果如下，Migration Tools版本为：3.2.3

| Migration功能	测试结果	备注
自动安装MM功能	MM无法正常启动	ESXi 5.5环境中测试，MM版本：8.3.0.4
自动迁移License功能	Migration Tools不认可MNP的证书，无法建立SSL连接	测试地点：上海 分别测试DNS：114.114.114.114，1.1.1.1，8.8.8.8
AOS6.x升级AOS8.x	成功	6.5.4.8升级至8.3.0.4
AOS8.x降级AOS6.x	成功	8.3.0.4降级至6.5.4.8

Migration Tool下载

① 连接到Support或其他能够下载版本的网站

| Home | Announcements | Download Software | Tools & Resources | Documentation | Lifetime Warranty Software | Contact Us |

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Mobility Master
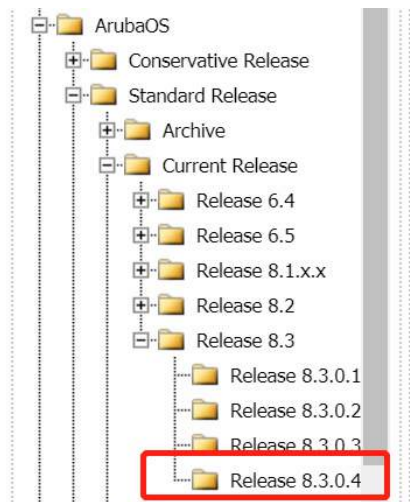
	ArubaOS_VMC_8.3.0.4_67604	ArubaOS Image for Virtual Mobility Controller		11/7/2018	153.2 MB
	ArubaOS_VMC_8.3.0.4_67604.iso	ISO file for Virtual Mobility Controller		11/7/2018	249.2 MB
	ArubaOS_VMC_8.3.0.4_67604.ova	OVA file for Virtual Mobility Controller		11/7/2018	163.7 MB
	MigrationTool_V3.2.3.ova	Migration Tool		11/7/2018	1.2 GB
	standard-mibs_8.3.0.4_67604.tar.gz	Standard Mibs		11/7/2018	153.8 KB

③ 选择目录下的Migration Tool

ArubaOS
  Conservative Release
  Standard Release
    Archive
    Current Release
      Release 6.4
      Release 6.5
      Release 8.1.x.x
      Release 8.2
      Release 8.3
        Release 8.3.0.1
        Release 8.3.0.2
        Release 8.3.0.3
        Release 8.3.0.4

Migration Tool VM Requirement

Listed below are the minimum resources required for the migration tool VM to function:

- 1 CPU
- 2 GB memory
- 16 GB disk space
- 1 virtual NICs

② 选择ArubaOS目录

④ 准备相应的系统资源

下载&使用说明

- 最新AOS8.x版本对应的 Migration Tool

- Migration Tool对硬件需求很低

- 建议安装在工程师笔记本中，将网卡直接桥接到客户网络中即可对控制器进行操作

- Migration Tool要求与控制器IP互通，不能经过 NAT设备

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Migration Tool注意事项

请注意以下问题：

- 待升级无线控制器的"Controller-ip"一定要手动配置

- Mobility Master建议手动安装，并导入MM License

- Mobility Master的MD Folder不能提前建好，Migration Tool只能向空白的Folder内转移控制器

举例：无线控制器设计的路径为/md/brycelab/controller，则升级前MM中不能有路径为/md/brycelab的folder存在

- 通过Migration Tool，原本从6.x升级到8.x，降低到6.x的无线控制器，碰巧又在升级后重置过MM的情况下，再次升级到8.x的话，升级最后阶段，会出现控制器无法关联到MM

临时解决方法：使用本地配置模式，在MD上配置"masterip <controller_ip> ipsec <key>"，在MM上配置"localip <controller_ip> ipsec <key>"

原因在于重置MM并不会把对应控制器的pki ServerCert删除，扩展阅读：Delete-Server-Cert-on-MM-AOS-8-3

- 启用Mesh架构的6.x无法通过Migration升级到8.x

- 无线控制器7280在修改过uplink interface的speed-mode的情况下，无法通过Migration Tool升级到8.x

- 通过Migration Tool升级Master-local架构，就算只添加local控制器升级，Migration Tool也会重启Master控制器

Migration Tool安装

安装以VMware Workstation作为示例，在Vmware ESXI中为ovf导入
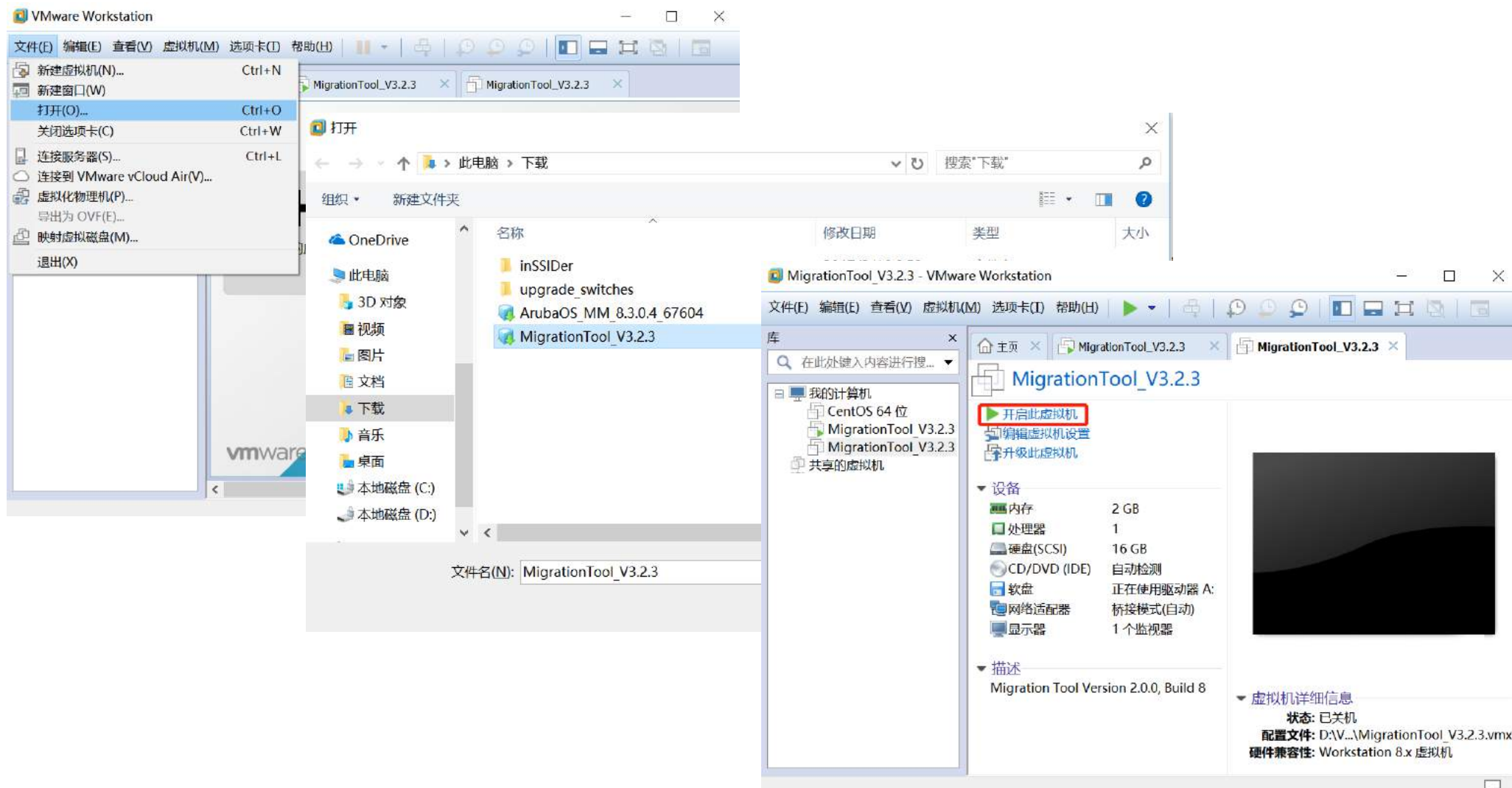
Migration Tool初始化

初始化说明
Migration Tool默认用户名密码为root/root123

初始化获取IP即可，手动配置IP需要额外配置，一定要注意DNS解析是否正常

WEB界面登陆URL如下：
https://<ip-add>:5001

```
Kernel 3.10.0-327.28.2.el7.x86_64 on an x86_64

MigrationTool login: root
Password:
Last login: Wed Dec 19 16:30:32 on tty1
[root@MigrationTool ~]# ifconfig ens160 192.168.1.201 netmask 255.255.255.0
[root@MigrationTool ~]# route add default gw 192.168.1.1 ens160
[root@MigrationTool ~]# echo "nameserver 114.114.114.114" >> /etc/resolv.conf
[root@MigrationTool ~]# ping 114.114.114.114
PING 114.114.114.114 (114.114.114.114) 56(84) bytes of data.
64 bytes from 114.114.114.114: icmp_seq=1 ttl=80 time=34.3 ms
64 bytes from 114.114.114.114: icmp_seq=2 ttl=79 time=25.2 ms
64 bytes from 114.114.114.114: icmp_seq=3 ttl=85 time=24.5 ms
64 bytes from 114.114.114.114: icmp_seq=4 ttl=89 time=26.0 ms
64 bytes from 114.114.114.114: icmp_seq=5 ttl=90 time=25.2 ms
64 bytes from 114.114.114.114: icmp_seq=6 ttl=83 time=26.2 ms
^C
--- 114.114.114.114 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5010ms
rtt min/avg/max/mdev = 24.569/26.955/34.349/3.359 ms
[root@MigrationTool ~]# ping www.baidu.com
PING www.a.shifen.com (61.135.169.121) 56(84) bytes of data.
64 bytes from 61.135.169.121: icmp_seq=1 ttl=55 time=29.2 ms
64 bytes from 61.135.169.121: icmp_seq=2 ttl=55 time=30.5 ms
^C
--- www.a.shifen.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1004ms
rtt min/avg/max/mdev = 29.292/29.925/30.559/0.656 ms
[root@MigrationTool ~]# ping h10145.www1.hpe.com
PING lap-esvc.glb.itcs.hpe.com (16.248.72.55) 56(84) bytes of data.
64 bytes from houston4-lap-esvc.itcs.hpe.com (16.248.72.55): icmp_seq=1 ttl=238 time=538 ms
^C64 bytes from 16.248.72.55: icmp_seq=2 ttl=238 time=511 ms

--- lap-esvc.glb.itcs.hpe.com ping statistics ---
2 packets transmitted, 2 received, 0% packet
rtt min/avg/max/mdev = 511.637/524.867/538.09
[root@MigrationTool ~]#
```

Ifconfig ens160 192.168.1.201 netmask 255.255.255.0
#设置IP地址及掩码
Route add default gw 192.168.1.1 ens160
#设置网关
Echo "nameserver 114.114.114.114" >> /etc/resolv.conf
#设置DNS

Migration Tool – 主界面

aruba Mobility Master Migration Tool
Version 3.2.0, Build 3

Home

Home

本次介绍主要涉及的两个功能：
- 6.x升级至8.x
- 8.x降级至6.x

Action: ◉ Upgrade to 8.X ○ Downgrade to 6.X ○ Orchestrate MC-VA ○ Preview Config

Select Data Input Type: ◉ XML ○ Manual

Upload Device List (XML): [Choose File] No file chosen

[Proceed]

Migration Tool – 6.x升级至8.x

VMM的类型：
- HMM – 硬件MM
- MCM – 控制器MM
- VMM – 虚拟机MM

升级前的架构：
- Master-Local
- All Master

Migration Tool – 6.x升级至8.x

建议选择"No"，不自动安装MM
选Yes:
- ESXi
- KVM
- HypeV

是否有standby MM：
- Yes
- No

型号：
- MM-VA-500
- MM-VA-1K
- MM-VA-5K
- MM-VA-10K

MM所安装的硬盘
- 与虚拟机的硬盘名称对应

MM三张网卡
- 对应虚拟机的网卡

Add Details   ✕

Deployment Mode ●────────────── Orchestration ●────────────── Mobility Master ○────────────── Devices ○

Orchestration

Orchestrate MM VM: Yes ▼   ESXi ▼

Orchestrate standby MM: No ▼

Device type: MM-VA-500 ▼

ESXi Server

IP address: 192.168.1.248

User name: root

Data store: datastore1

Network adapter 1: INT

Network adapter 2: EXT

Network adapter 3: INT

Allowed VLAN: 4095

VLAN promiscuous mode: 0

Console port: 9000   Please make sure server firewall allows this port

- 虚拟机IP地址
- 虚拟机用户名与密码

Note: VSwitch, Virtual NIC, VM port group, VLAN ID, VLAN promiscuous mode parameters must be configured on the ESXI server before initiating the migration tool. Only Network adapter 2 which corresponds to GE 0/0/0 will be in Connected state and can be used as uplink port. Device Status for Connected & Connect at power on should be enabled manually after Orchestration. For more information see Aruba Mobility Master Installation Guide.

Cancel   Back   Next

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Migration Tool – 6.x升级至8.x

MM的IP地址

MM的用户名

自动安装MM的情况下填写：
- 子网掩码
- 网关地址
- 主机名
- 版本（镜像文件需自行上传）
- VLAN号
- 接口模式
- 国家代码
- 日期
  时间
- 时区

是否转换License至8.x
- Yes
- No

MNP网站用户名

Add Details

Deployment Mode   Orchestration   Mobility Master   Devices

MM VM

IP address:	172.16.0.254
User name:	admin
Netmask:	255.255.255.0
IP gateway:	172.16.0.1
System name:	ArubaMM
MM image file name:	ArubaOS_MM_8.3.0.4_67604.ova
VLAN ID:	1
Port:	GE 0/0/0
Mode:	Access
Country code:	AD - Andorra
Date (mm/dd/yyyy):	12/19/2018
Time (hh:mm:ss):	21:42:08
Time zone:	GMT GMT
Migrate licences:	Yes
Register licences:	No
MNP username:	123@123.com

自动安装MM的情况下填写：
是否自动注册MM License（需提供Order number和邮箱，与正常激活的要求一样）

Cancel   Back   Next

Migration Tool – 6.x升级至8.x

Add Device添加需要转换的控制器

是否需要转换Master控制器

Node是否存在

新建的Node名称

选择Add Device的情况下填写：
- 控制器类型
- 控制器IP
- 控制器用户名
- 8.X 镜像文件（需要自行导入）
- 6.X 镜像文件（不明作用，导入与当前相同版本）
- 8.X 镜像文件导入的分区

Migration Tool – 6.x升级至8.x

Migration Tool – 6.x升级至8.x

Migration Tool – 8.x降级至6.x

VMM的类型：
- HMM – 硬件MM
- MCM – 控制器MM
- VMM – 虚拟机MM

Migration Tool – 8.x降级至6.x

MM的IP地址

MM的用户名

是否转换License至6.x
- Yes
- No

Add Details

Deployment Mode ──────── Mobility Master ──────── Devices

MM VM

IP address: `172.16.0.254`

User name: `admin`

Migrate licences: `No` ▾

如果没有MM，降级过程中会报错，因此不支持独立的MD的降级

Cancel   Back   Next

Migration Tool – 8.x降级至6.x

Add Device添加需要
转换的控制器

选择Add Device的情况下填写：
- 控制器类型
- 控制器IP
- 控制器用户名
- 6.X 镜像文件（需要自行导入）
- 6.X 镜像文件导入的分区

Migration Tool – 8.x降级至6.x

Migration Tool 密码

MM密码

控制器密码

开始降级

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Mobility Master Migration Tool
Version 3.2.0, Build 3

Home

Log out

Host Details

IP ADDRESS	TYPE	USERNAME	PASSWORD
172.20.10.12	Tool Host Computer	root	

Mobility Master

IP ADDRESS		USERNAME		PASSWORD
192.168.1.240		admin		

Devices

IP ADDRESS	NODE TYPE	MIGRATE	6.X IMAGE	IMAGE PARTITION	USERNAME	PASSWORD	ENABLE PASSWORD (NOT REQUIRED IF "ENABLE BYPASS" IS ACTIVE)	STATUS
192.168.1.243	Master Controller	true	/root/Migration/Image/ArubaOS_70xx_8.5.4.8_85873	1	admin			--

Start Over | Start Downgrade

Migration Tool_v3.2.3 修复MNP连接问题

问题说明：

在启用<Migrate license>选项的情况下，在转换过程中会出现<Could not connect to MNP...>提示。

导致Migration tools无法帮助工程师自动完成6.x至8.x的License转换

Add Details

Deployment Mode

MM VM

IP address:	172.16.0.254
User name:	admin
Topology has custom cert?:	No
Migrate licences:	Yes
MNP username:	

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192.168.1.33	Tool Host Computer	root	

Mobility Master

IP ADDRESS	NODE TYPE
172.16.0.254	MM VM

Licence Migrate

bryce.xiang@microchina.com.cn

ALERT!

Could not connect to MNP. Check network settings like internet connectivity and DNS

Close

故障提示

Devices

IP ADDRESS	NODE TYPE	MIGRATE	MM IMAGE	IMAGE PARTITION	NODE NAME	USERNAME	PASSWORD	ENABLE PASSWORD (NOT REQUIRED IF 'ENABLE BYPASS' IS ACTIVE)	STATUS
192.168.1.240	Master Controller	true	/root/Migration/Image/ArubaOS_70xx_8.3.0.4_67604	1	/md/mynode11/controller1321	111			FAILED-PRE-MIGRATION-HEALTH-CHECK (i)

Start Over   Start Upgrade

≡   Logs - Migration

[2018-12-17 17:05:05,814: INFO/MainProcess] Task MigrationTool.revert[6bc5add9-ce10-44e8-9cc7-55241641b261] succeeded in 508.812843228s: {'current': 100, 'status': 'DOWNGRADE COMPLETED', 'total': 100, 'result': 'SUCCESS', 'migration_type': 'DOWNGRADE'}
[2018-12-19 04:05:34,306: INFO/MainProcess] Received task: MigrationTool.start_migration[54752b14-2795-44da-84fb-04207875e2e0]
[2018-12-19 04:05:34,309: WARNING/Worker-6] starting........
[2018-12-19 04:05:34,371: INFO/Worker-6] Starting new HTTPS connection (1): h10145.www1.hpe.com
[2018-12-19 04:05:40,382: WARNING/Worker-6] Could not connect to MNP.
[2018-12-19 04:05:40,385: WARNING/Worker-6] --------------------
[2018-12-19 04:05:40,386: WARNING/Worker-6] Cleaning Passwords, Keys and Serial Number from Migration Tool
[2018-12-19 04:05:40,386: WARNING/Worker-6] --------------------
[2018-12-19 04:05:40,388: INFO/MainProcess] Task MigrationTool.start_migration[54752b14-2795-44da-84fb-04207875e2e0] succeeded in 6.08036311201s: {'current': 0, 'status': 'FAILED-PRE-MIGRATION-HEALTH-CHECK', 'total': 100, 'result': 'FAILURE', 'migration_type': 'UPGRADE'}\n

Migration Tool_v3.2.3 修复MNP连接问题 – 排障思路

GFW策略封堵

连接故障发生

其他问题

抓包验证

证书问题
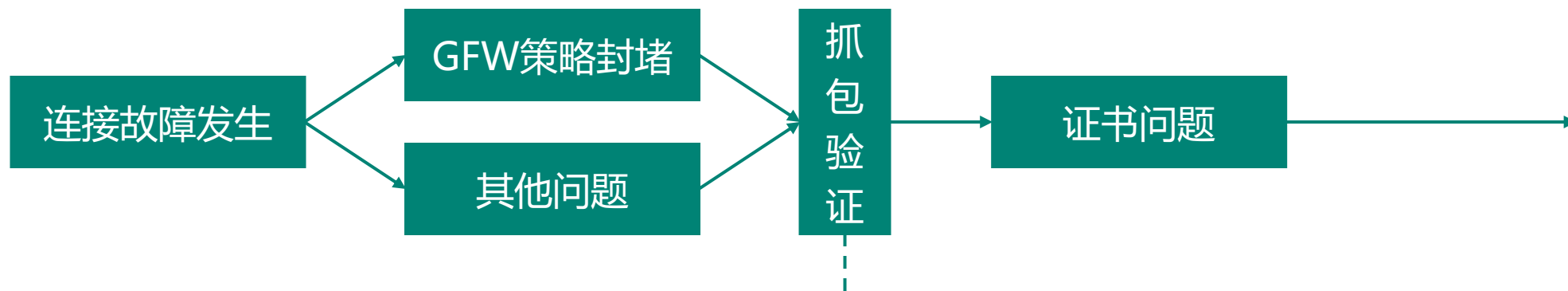
57 11.385886	114.114.114.114	192.168.174.129	DNS	148 Standard query response 0xc1bc No such name A MigrationTool SO
58 11.480664	192.168.174.129	192.168.174.2	DNS	79 Standard query 0xcf2e A h10145.www1.hpe.com
59 11.480756	192.168.174.129	192.168.174.2	DNS	79 Standard query 0x5875 AAAA h10145.www1.hpe.com
60 11.505100	192.168.174.2	192.168.174.129	DNS	142 Standard query response 0x5875 AAAA h10145.www1.hpe.com CNAME
61 11.506127	192.168.174.2	192.168.174.129	DNS	158 Standard query response 0xcf2e A h10145.www1.hpe.com CNAME lap
62 11.506916	192.168.174.129	16.250.72.56	TCP	74 47754 → 443 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 T
63 11.586132	Vmware_c0:00:08	Broadcast	ARP	42 Who has 192.168.174.2? Tell 192.168.174.1
64 12.068533	16.250.72.56	192.168.174.129	TCP	58 443 → 47754 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
65 12.068787	192.168.174.129	16.250.72.56	TCP	54 47754 → 443 [ACK] Seq=1 Ack=1 Win=29200 Len=0
66 12.162274	192.168.174.129	16.250.72.56	TLSv1	309 Client Hello
67 12.162698	16.250.72.56	192.168.174.129	TCP	54 443 → 47754 [ACK] Seq=1 Ack=256 Win=64240 Len=0
68 12.682970	16.250.72.56	192.168.174.129	TLSv1…	1514 Server Hello
69 12.683038	16.250.72.56	192.168.174.129	TLSv1…	620 Certificate, Server Hello Done
70 12.683293	192.168.174.129	16.250.72.56	TCP	54 47754 → 443 [ACK] Seq=256 Ack=1461 Win=32120 Len=0
71 12.683506	192.168.174.129	16.250.72.56	TCP	54 47754 → 443 [ACK] Seq=256 Ack=2027 Win=35040 Len=0
72 12.684931	192.168.174.129	16.250.72.56	TLSv1…	61 Alert (Level: Fatal, Description: Unknown CA)
73 12.685283	16.250.72.56	192.168.174.129	TCP	54 443 → 47754 [ACK] Seq=2027 Ack=263 Win=64240 Len=0
74 12.692512	192.168.174.129	16.250.72.56	TCP	54 47754 → 443 [RST, ACK] Seq=263 Ack=2027 Win=35040 Len=0
75 12.692673	192.168.174.129	16.250.72.56	TCP	54 47754 → 443 [RST] Seq=263 Win=0 Len=0

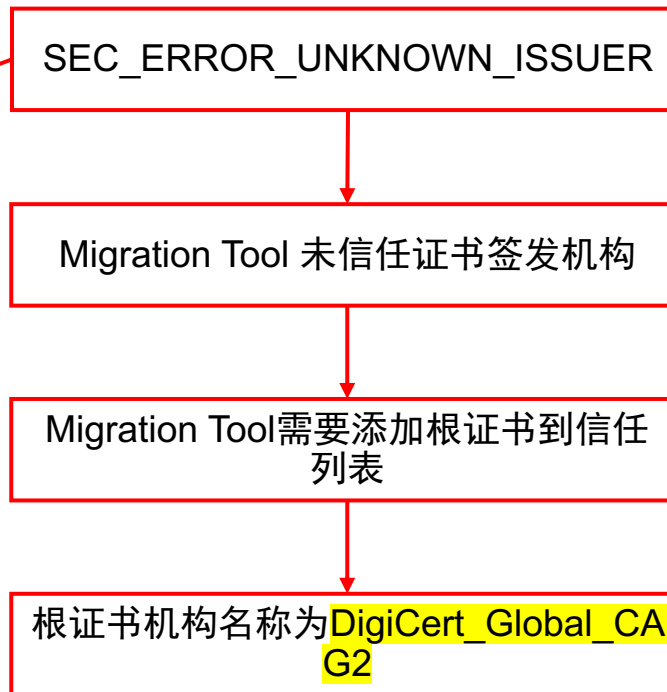严重的告警，无效的CA证书

Migration Tool_v3.2.3 修复MNP连接问题 – 排障思路

DigiCert Global CA G2

Issuer: DigiCert Global Root G2
Valid until: 01/Aug/2028
Serial #: 0C:8E:E0:C9:0D:6A:89:15:88:04:06:1E:E2:41:F9:AF
Thumbprint: D6AEE31631F7ABC56B9DE8ABECCC4108A626B104
Download

证书问题 → 检查系统日志 → 下载根证书

https://www.digicert.com/digicert-root-certificates.htm

```
[root@MigrationTool ~]# curl -v https://h10145.www1.hpe.com
* About to connect() to h10145.www1.hpe.com port 443 (#0)
*   Trying 16.250.72.56...
* Connected to h10145.www1.hpe.com (16.250.72.56) port 443 (#0)
* Initializing NSS with certpath: sql:/etc/pki/nssdb
*   CAfile: /etc/pki/tls/certs/ca-bundle.crt
  CApath: none
* Server certificate:
*       subject: CN=h10145.www1.hpe.com,OU=HPEIT,O=Hewlett Packard Enterprise Company,L=Palo Alto,ST=California,C=US
*       start date: Jun 20 00:00:00 2018 GMT
*       expire date: Jun 21 12:00:00 2019 GMT
*       common name: h10145.www1.hpe.com
*       issuer: CN=DigiCert Global CA G2,O=DigiCert Inc,C=US
* NSS error -8179 (SEC_ERROR_UNKNOWN_ISSUER)
* Peer's Certificate issuer is not recognized.
* Closing connection 0
curl: (60) Peer's Certificate issuer is not recognized.
More details here: http://curl.haxx.se/docs/sslcerts.html

curl performs SSL certificate verification by default, using a "bundle"
 of Certificate Authority (CA) public keys (CA certs). If the default
 bundle file isn't adequate, you can specify an alternate file
 using the --cacert option.
If this HTTPS server uses a certificate signed by a CA represented in
 the bundle, the certificate verification probably failed due to a
 problem with the certificate (it might be expired, or the name might
 not match the domain name in the URL).
If you'd like to turn off curl's verification of the certificate, use
 the -k (or --insecure) option.
[root@MigrationTool ~]# ^C
```

SEC_ERROR_UNKNOWN_ISSUER
↓
Migration Tool 未信任证书签发机构
↓
Migration Tool需要添加根证书到信任列表
↓
根证书机构名称为DigiCert_Global_CA G2

Migration Tool_v3.2.3 修复MNP连接问题 – 排障思路

DigiCert Global CA G2	Issuer: DigiCert Global Root G2 Valid until: 01/Aug/2028 Serial #: 0C:8E:E0:C9:0D:6A:89:15:88:04:06:1E:E2:41:F9:AF Thumbprint: D6AEE31631F7ABC56B9DE8ABECCC4108A626B104 Download

```
TLSv1...    1514 Server Hello
TLSv1...     620 Certificate, Server Hello Done
TCP           54 35678 → 443 [ACK] Seq=256 Ack=1461 Win=32120 Len=0
TCP           54 35678 → 443 [ACK] Seq=256 Ack=2027 Win=35040 Len=0
TLSv1...     412 Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
TCP           54 443 → 35678 [ACK] Seq=2027 Ack=614 Win=64240 Len=0
TLSv1...     145 Change Cipher Spec, Encrypted Handshake Message
```

下载根证书 → 导入根证书 → 安装证书 → 解决问题

```
/root/Migration/Image/
名字                                    大小        已改变                  权限
.                                                  2018/5/7 9:25:11        rwx
ArubaOS_70xx_6.5.4.8_65873        140,181 ...   2018/12/19 13:47:18     rw-
ArubaOS_70xx_8.3.0.4_67604        159,225 ...   2018/12/19 13:50:37     rw-
DigiCertGlobalCAG2.crt                2 KB     2018/12/17 23:00:20     rw-
```

```
[root@MigrationTool ~]# cd Migration/Image
[root@MigrationTool Image]# openssl x509 -inform der -in DigiCertGlobalCAG2.crt  -out certificate-2.pem
[root@MigrationTool Image]# cat certificate-2.pem >> /etc/pki/tls/certs/ca-bundle.crt
[root@MigrationTool Image]# certutil -d sql:/etc/pki/nssdb -A -t "C,C,C" -n "DigiCert Global CA G2" -i certificate-2.pem
[root@MigrationTool Image]# curl -v https://h10145.www1.hpe.com
* About to connect() to h10145.www1.hpe.com port 443 (#0)
*   Trying 16.250.72.56...
* Connected to h10145.www1.hpe.com (16.250.72.56) port 443 (#0)
* Initializing NSS with certpath: sql:/etc/pki/nssdb
*   CAfile: /etc/pki/tls/certs/ca-bundle.crt
  CApath: none
* SSL connection using TLS_RSA_WITH_AES_256_CBC_SHA256
* Server certificate:
*     subject: CN=h10145.www1.hpe.com,OU=HPEIT,O=Hewlett Packard Enterprise Company,L=Palo Alto,ST=California,C=
*     start date: Jun 20 00:00:00 2018 GMT
*     expire date: Jun 21 12:00:00 2019 GMT
*     common name: h10145.www1.hpe.com
*     issuer: CN=DigiCert Global CA G2,O=DigiCert Inc,C=US
> GET / HTTP/1.1
> User-Agent: curl/7.29.0
> Host: h10145.www1.hpe
> Accept: */*
```

使用软件：WinSCP

连接方式：SCP

连接IP：Migration Tool IP

连接用户名密码：root/root123

推荐安装目录：
/root/Migration/Image

openssl x509 -inform der -in DigiCertGlobalCAG2.crt -out certificate-2.pem
#证书Base64编码
cat certificate-2.pem >> /etc/pki/tls/certs/ca-bundle.crt
#添加到证书信任表
certutil -d sql:/etc/pki/nssdb -A -t "C,C,C" -n "DigiCert Global CA G2" -i certificate-2.pem
#添加到nss(linux名称解析服务)

Thank You