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Huawei SmartCutover to Make Fixed Transformation Easier

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A Challenging But Necessary Migration

With the rapid transformation of telecommunications, PSTN equipment is gradually being phased out. Besides, competition from VoIP and mobile service substitution for fixed services is leading to significant ARPU decreases, while the OPEX is still rising because of EOS(End of Support) issues. Therefore, replacing the PSTN equipments has thus been gradually taken into serious consideration by most of the fixed carriers.

Migrating PSTN equipment is difficult, especially in the cutover phase. The migration requires large-scale manual operations, a large amount of manpower, and a long period of time. In addition, there may be a high error rate during the cutover, and mass data configurations and subscriber line cutovers are required. Moreover, the migration requires highly skilled and experienced technicians because different types of switches, different vendors, and legacy services are involved during the migration.

Therefore, a professional cutover solution that features low cost, low risk, and high efficiency is required.

Huawei SmartCutover to Make
Fixed Transformation Easier

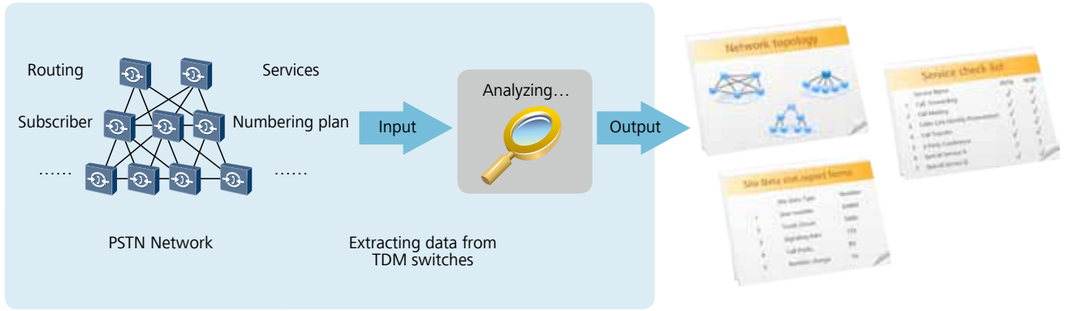
Huawei SmartCutover Simplifies Fixed Transformation

Huawei SmartCutover is designed to tackle the difficulties during the migration planning, design, and implementation phases. It makes Fixed Transformation easy, safe, and efficient.

Huawei SmartCutover consists of a data analysis tool used in the planning phase, a data conversion tool, a cutover method applicable to Class 4 trunk migration, and an automatic dial-up test tool in the implementation phase.

The data analysis tool is used to extract the information from the existing TDM switch and assist in migration planning.

Figure 1 PSTN data analysis tool



Usually, PSTN equipment is provided by different vendors. Therefore, the models and versions of switches are different. A large number of central offices, locations, and transmission links add to the complexity of the PSTN network architecture and data mapping. Also, engineers may not have complete technical knowledge of the legacy equipment, which makes migration even more complex.

Based on its 10 years of experience in PSTN migration, Huawei has developed the data analysis tool, which supports most of switch models supplied by mainstream vendors. The supported equipment models are as follows:

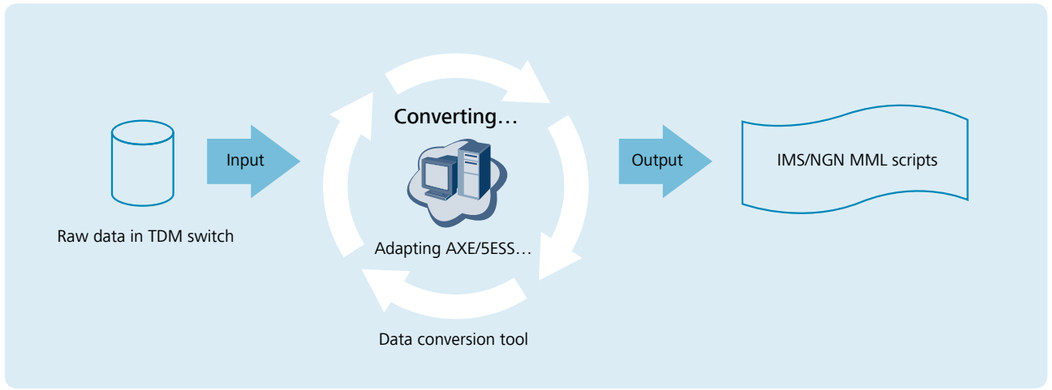
Table 1 TDM Switch Models

Type	Vendor	Equipment Model
C5	Ericsson	AXE10/AXE16/AXE20/AXE38/AXE810/Pre IMS
	NEC	NEAX EM/NEAX ES/NEAX EVS/NEAX KE/NEAX 1.7/NEAX 7.5/NEAX 6.1
	Nokia	NOKIA DX220
	Fujitsu	FETEX 150
	Nortel	DMS100/CS2K
	Lucent	5ESS
	Siemens	EWSD
	Italtel	UT100 CL
	Huawei	C&C08, SoftX3000
	Alcatel	ALCATEL e10
C4	Nortel	DMS 100
		GSP
	Lucent	5ESS

The data analysis tool can be used to analyze PSTN data and generate reports (including statistics information, network topology, and mapping table), making it easier to understand legacy networks and plan new networks, which in turn improves the accuracy of service inheritance.

The data conversion tool is used to reduce time and lower risks of data conversion.

Figure 2: PSTN data conversion tool



After the data on the existing network is analyzed and the new network is designed, a large amount of PSTN data needs to be imported into the new NGN or IMS database. Manually converting this data is risky and costly, and requires a large amount of resources.

The data conversion tool provided by Huawei can be used to append new network planning information to raw data from the legacy switches, convert the data to MML scripts stored in files that are in the required format, and import these files into the NGN/IMS database in batches. This improves the migration efficiency and reduces the error rate compared with other traditional methods.

For example, a migration project in the Middle East involves five different types of equipment and 61 central offices. There are 200,000 prefixes, 5,000 routes, 100,000 subscribers, and 300 office directions in each office. A manual conversion requires at least 60 person-days, and there is a high risk of manual errors. However, if Huawei data analysis and conversion tools are used, only 5 person-days are required and there is no risk of manual errors. This significantly improves both the quality and efficiency of the fixed transformation.

Table 2 Benefit of Huawei data analysis and conversion tools

	Traditional manual	Huawei SmartCutover
Workload	11 person-days	1 person-day
Summary: The data conversion tool can convert data at the speed of 100,000 subscribers per hour. Data analysis and conversion make up of 10% of the total project workload. Therefore, Huawei SmartCutover reduces at least 9% of the total workload. **Note:** Assume that 20,000 subscribers are migrated.		

No coordination is required from peer offices in Class 4 trunk migration.

During the traditional Class 4 trunk migration (including international gateways), cooperation of the peer office is required. In a scenario involving an IGW that serves hundreds of peer offices, it becomes costly, time-consuming, and difficult to obtain the necessary coordination during migration.

Huawei SmartCutover adopts the shared SPC (Signaling Point Code) cutover technique, making the trunk and circuit migration transparent to peer offices during the TDM trunk cutover. This function is based on the following features:

- Before and after migration, interworking between the new office and the office to be migrated is fully transparent to neighboring offices, such as Class 5 offices, gateway offices, and international offices. In addition, data modification of neighboring offices is not required.
- The new system (IMS/NGN) uses the same SPC that is used by the office to be migrated, reducing the requirement of new SPCs and thereby reducing cost.
- The services of the entire office are not interrupted. Only the services over E1 lines that are to be migrated are affected. The migration process is smooth, easy, simple, and features low risk, and rollbacks can be performed with the least impact on services.

By comparison, Huawei shared SPC cutover technique has distinct advantages over traditional migration techniques:

	Traditional techniques	Huawei shared SPC cutover
Need new SPC resource	Yes	No
Need peripheral coordination	Yes (All the connected equipment is involved.)	No
Rollback risks	High (Impact on the entire office)	Low (Only E1 lines to be migrated are involved.)
Service interruption	Impact on the entire office	No interruption

The C5 dial-up test tool is used to improve efficiency and detect jumper errors more accurately.

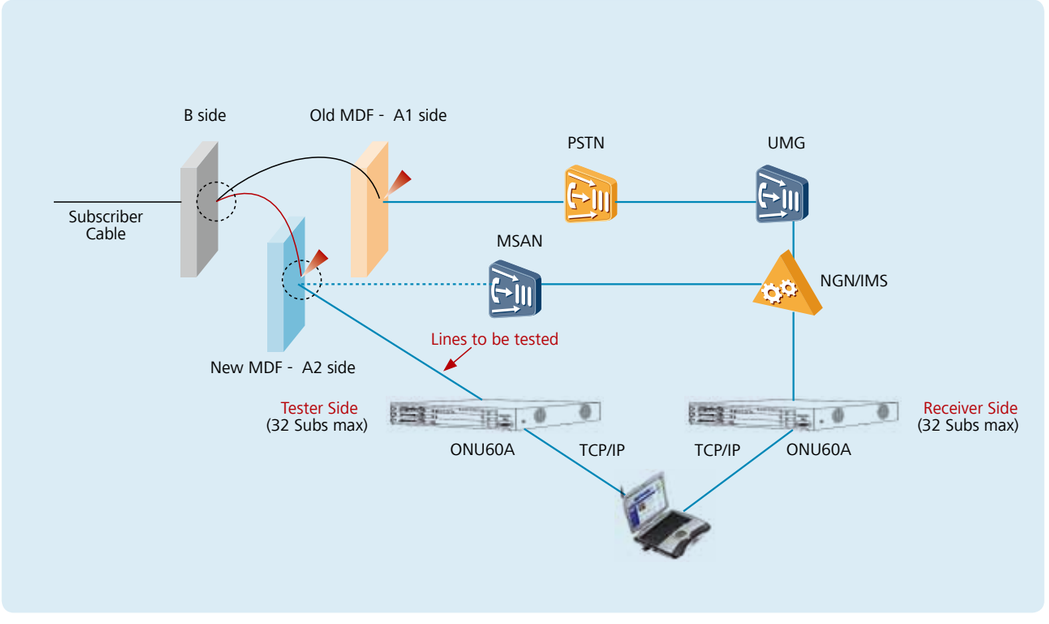
As PSTN equipment is being phased out, it is more difficult to retrieve information from the Class 5 MDF (main distribution frame) databases in the legacy PSTN equipment. In traditional migrations, Class 5 subscribers are migrated manually as follows:

- The cables are disconnected from the original MDFs.
- The disconnected cables are reconnected to the new MDFs.
- Services are verified.
- Jumper errors are rectified.

Among these operations, verifying services is complex and time-consuming, and requires a large amount of resources. Field engineers can perform migration only during off-peak hours. The whole process is highly risky, and the time taken for migration cannot be controlled.

Huawei C5 dial-up test tool is designed with an HW-SW combination to achieve higher efficiency and accuracy. The testing results are generated based on subscriber data in the database of PSTN switches. The testing results can be displayed on the GUI in batches.

Figure 3 C5 dial-up test tool



The working principle of the dial-up test tool is as follows:

- Connect subscriber lines in bulk to the test box on the tester side.
- Make simultaneous calls through these subscriber lines from the tester side.
- Calls are relayed through the legacy platform to the test box on the receiver side. All caller numbers are traced in the test box.
- The console obtains the caller numbers from the test boxes on both sides. The caller numbers are compared. The control software determines the caller numbers that do not match and generates a report that can be used for jumper error correction and further analysis.
- If no jumper errors are found or jumper errors are rectified, the old jumpers between B side and A1 side will be disconnected, and the jumpers between A2 side and MSAN will be connected.

	Traditional tool	C5 dial-up test tool
Workload	1000 lines per person-day (Subscribers in arrears, vacant numbers, or PBX equipment are not supported.)	6000 lines per person-day (Subscribers in arrears, vacant numbers, or PBX equipment are supported.)
Line-Jumping Error Rate	1.5%	0
Mode	manual	Automatic

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Huawei Worldwide Successful Migration Experience

Huawei is an exclusive vendor to migrate Carrier M's PSTN (in the Asia-Pacific area) and has been successful in migrating all its PSTN subscribers (up to 4.2 million subscribers). In Carrier M's PSTN networks, there were totally 11 types of switches from 5 vendors (Ericsson, Fujitsu, NEC, NSN, and ALU). A migration technique featuring high efficiency and accuracy was urgently required because of complexity involved in migration. With the customized solution and the advanced cutover tool (the data conversion tool), Huawei helped this biggest fixed-line carrier in its country migrate PSTN subscribers to Huawei systems. Huawei data conversion tool reduced the time required for converting original data by 90% when compared with traditional methods.

Huawei is helping Carrier O (in Latin America) to complete the seamless migration of international gateways by using the migration technique that uses the same SPC (Signaling Point Code). Every week, four switches are migrated on the PSTN and a total of 71 switches will be migrated on the entire PSTN network.

Carrier T, the biggest fixed-line carrier in its country(in West Asia), has just announced its PSTN migration plan. Huawei helped the carrier to migrate its first site in November 2010. Since then, The carrier has selected the Huawei SmartCutover to better perform its fixed transformation. More than 250,000 subscribers are being migrated each month. So far, more than 1,510,000 subscribers have been migrated to the Huawei NGN system, which makes Huawei the front runner among all vendors.

Summary

Fixed transformation has become inevitable for most fixed network carriers. Huawei SmartCutover is designed to tackle the difficulties faced during the planning, design and implementation phases of migration, and is cost-effective and highly efficient. Armed with 10 years of migration experience and ranked No.1 for having the biggest market share in the PSTN migration market, Huawei SmartCutover enables carriers to accomplish an easy, safe, and efficient PSTN migration.