openwayacademy

# Content
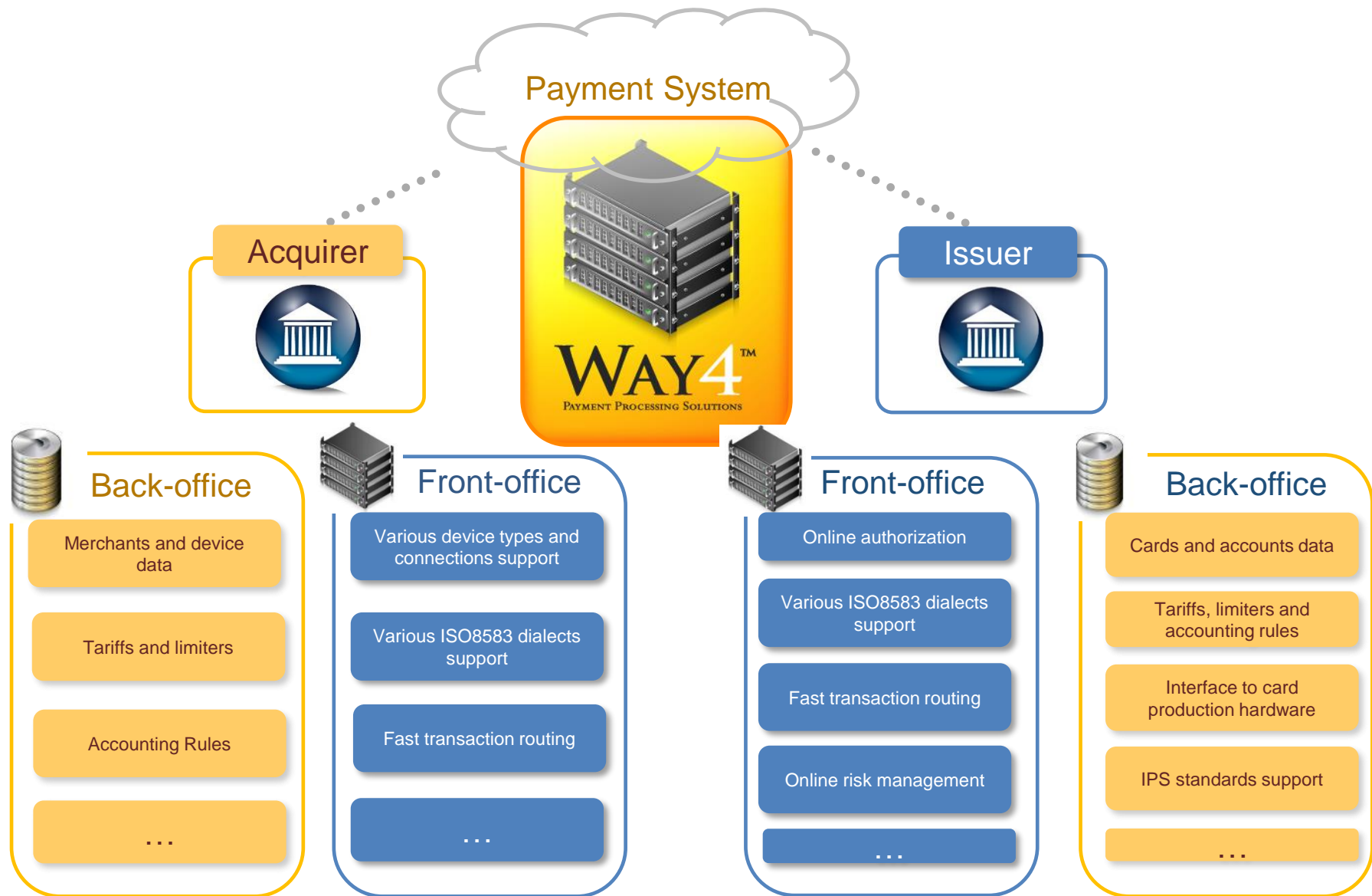
1. WAY4 System Architecture

2. Transaction Switch Architecture

3. File Structure of the Transaction Switch

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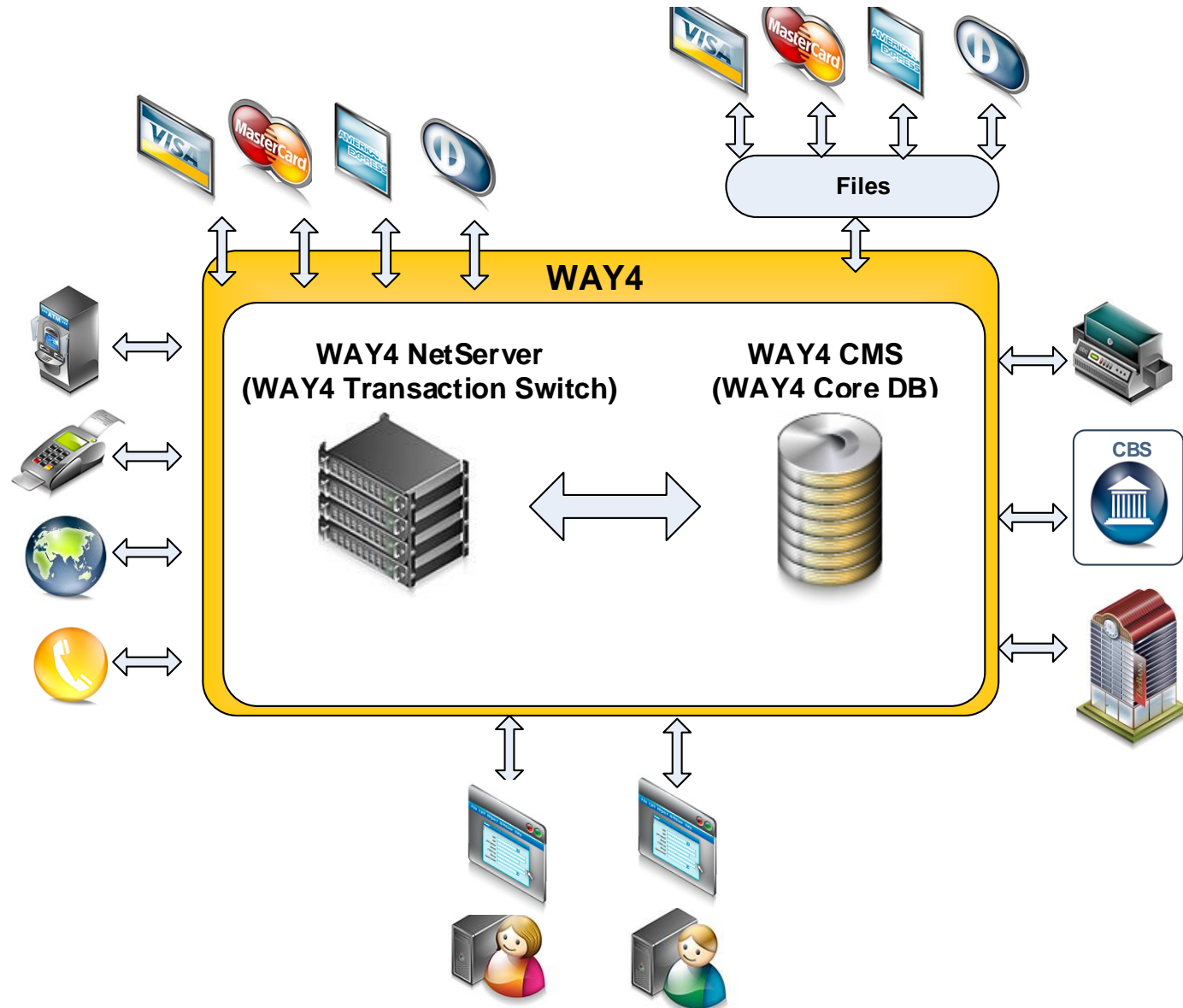
5. Transaction Switch Logs

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# WAY4 System Architecture

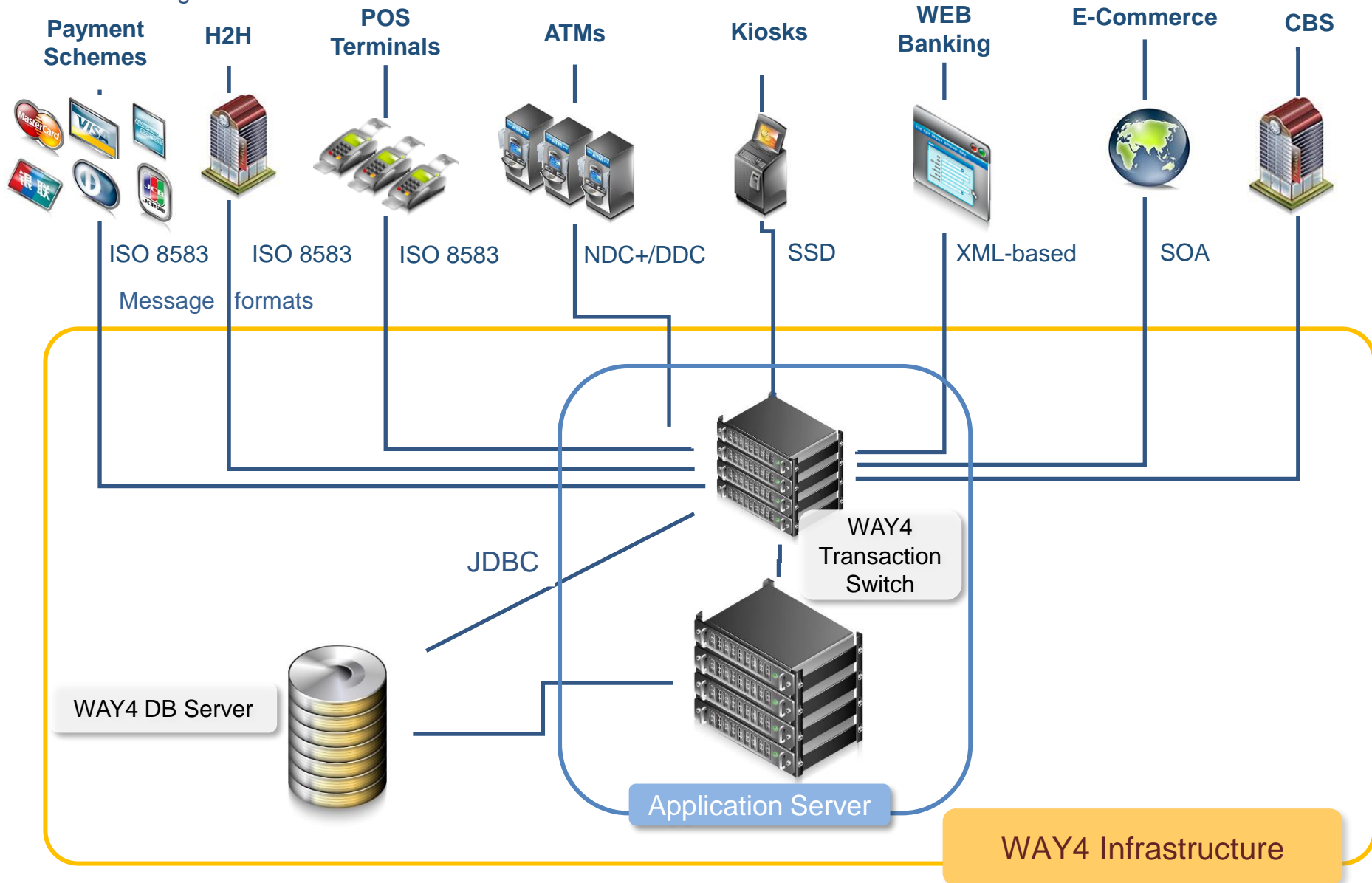# Requirements for Processing Systems

Payment System

**WAY4**™
PAYMENT PROCESSING SOLUTIONS

Acquirer

Issuer

## Back-office

Merchants and device data

Tariffs and limiters

Accounting Rules

. . .

## Front-office

Various device types and connections support

Various ISO8583 dialects support

Fast transaction routing

. . .

## Front-office

Online authorization

Various ISO8583 dialects support

Fast transaction routing

Online risk management

. . .

## Back-office

Cards and accounts data

Tariffs, limiters and accounting rules

Interface to card production hardware

IPS standards support

. . .

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**Files**

**WAY4**

**WAY4 NetServer
(WAY4 Transaction Switch)**

**WAY4 CMS
(WAY4 Core DB)**

CBS

# Transaction Switch Architecture

# WAY4 Transaction Switch

Online messages from channels:

**Payment Schemes** **H2H** **POS Terminals** **ATMs** **Kiosks** **WEB Banking** **E-Commerce** **CBS**

ISO 8583    ISO 8583    ISO 8583    NDC+/DDC    SSD    XML-based    SOA

Message  formats

JDBC

WAY4 Transaction Switch

WAY4 DB Server

Application Server

WAY4 Infrastructure

# Clusters

Online messages from channels:

**Payment Schemes**    **H2H**    **POS Terminals**    **ATMs**    **Kiosks**    **WEB Banking**    **E-Commerce**    **CBS**

ISO 8583    ISO 8583    ISO 8583    NDC+/DDC    SSD    XML-based    SOA

Message formats

WAY4 Transaction Switch Cluster

JDBC

WAY4 DB Server

Application Server

WAY4 Infrastructure

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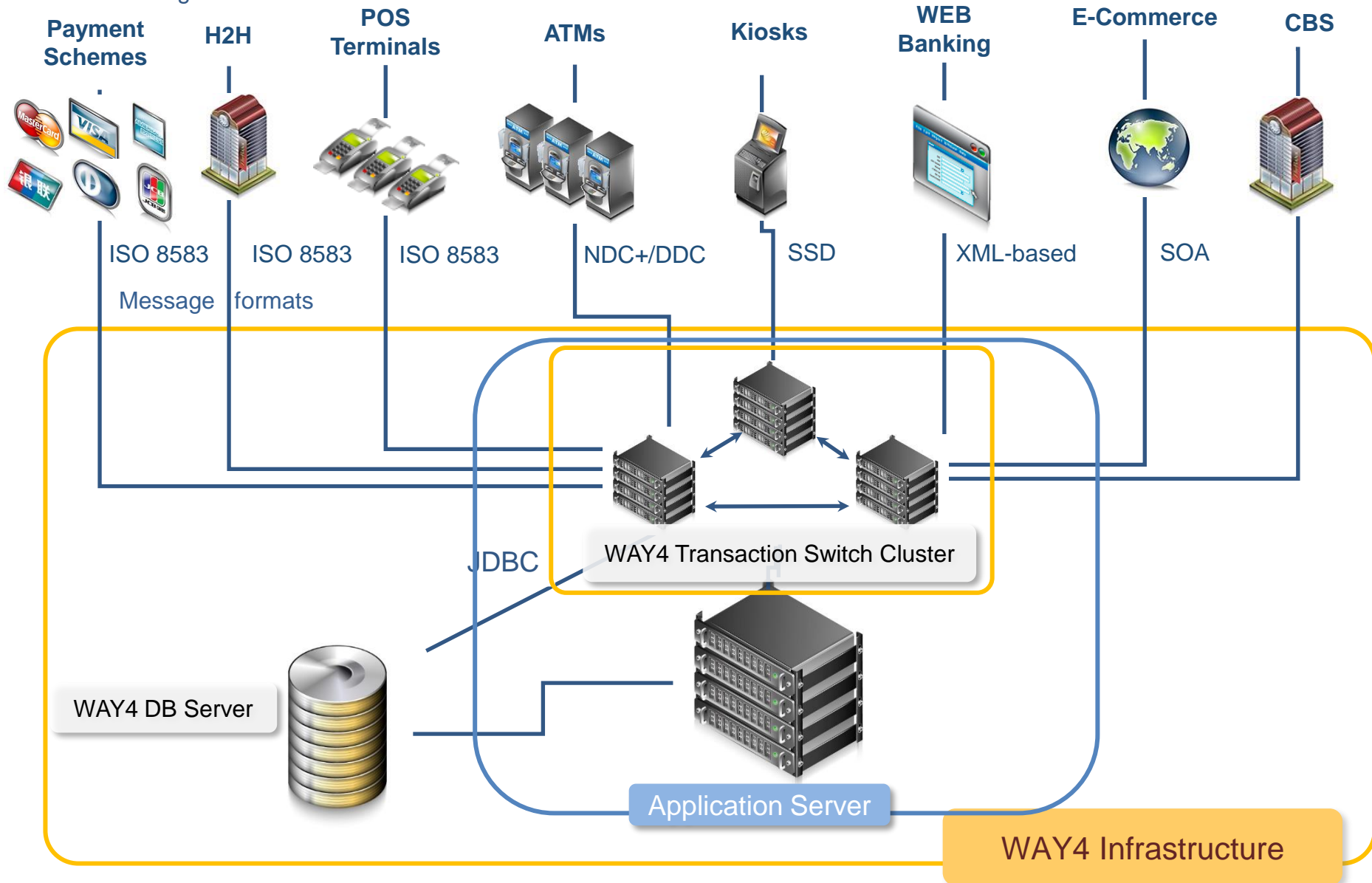
# Transaction Switch Architecture. Services and Adapters

**Operational System**

**WAY4 Application Server**

Transaction Switch

Ext. System 1

Adapter1

Service 2

Ext. System 2

Adapter3

System Service 4

TS Kernel

...

...
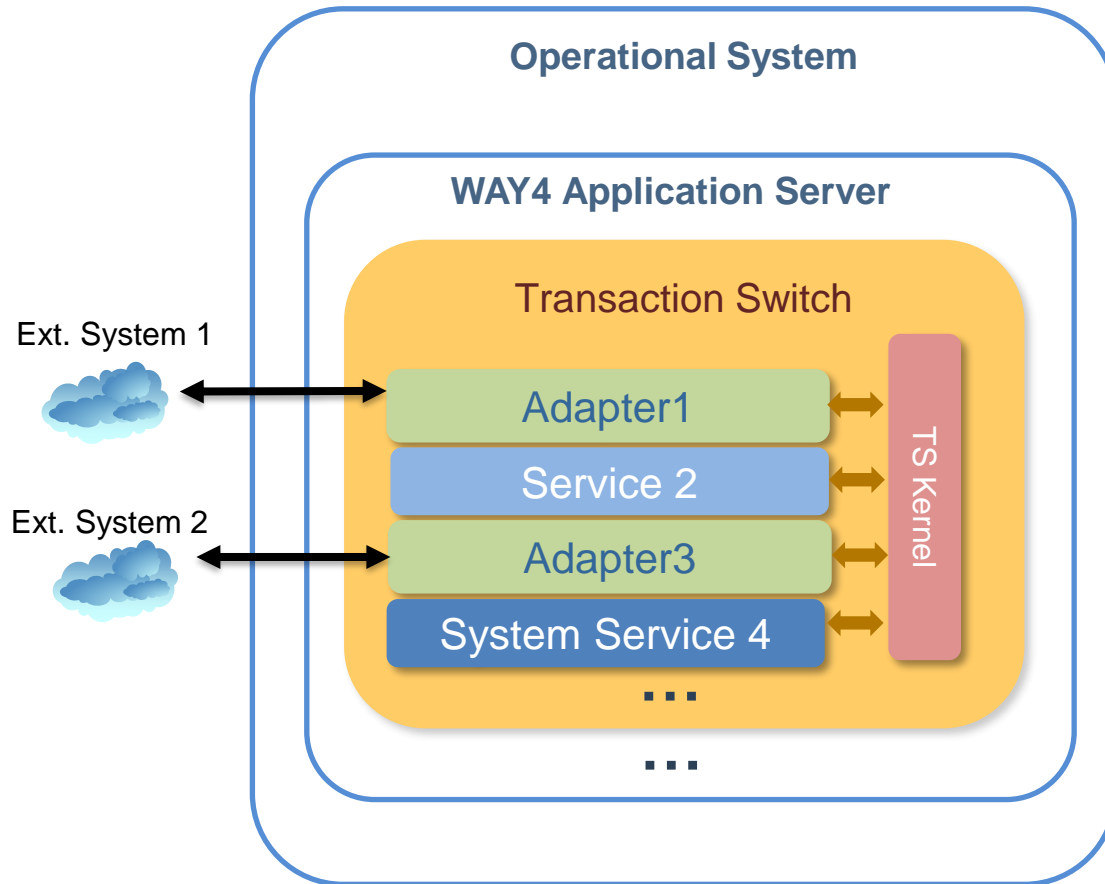
- **Service** – «internal» component of the Transaction Switch;

  - *to provide internal functions and interaction with other services or databases;*
    - ✓ AcquiringService;
    - ✓ RoutingService

- **Adapter** – «external» component of the Transaction Switch;

  - *to interact with the external system*
    - ✓ Visa Adapter
    - ✓ H2H Adapter
    - ✓ POS Adapter

- TS services work as "request – response"

# TS Interaction with DB and External Systems

**WAY4 Cards DB**

| TABLE_..... | TABLE_..... |
| TABLE_..... | TABLE_..... |
| TABLE_..... | TABLE_..... |

**WAY4 Transaction Switch**

| DB Services | WAY4 DB Service | Acquiring DB Service | Issuing DB Service |
| System Services | Acquiring Service | Authorization Service | … Service |
| Adapters | POS Controller Adapter | HSM Adapter | …. Adapter |

……

Protocols:
ISO 8583
UFX
CCOM
etc.
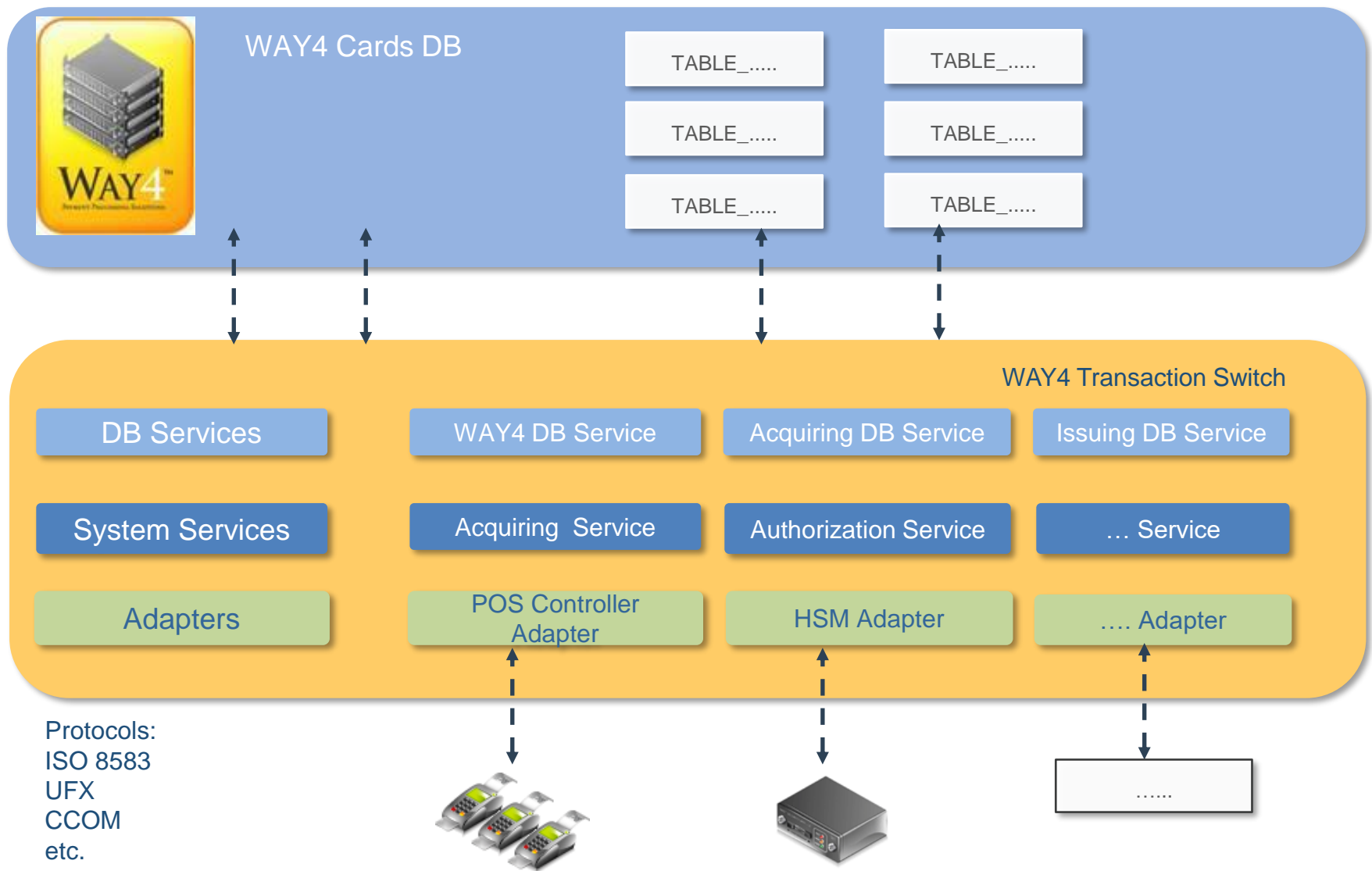
# Transaction Switch File System

# Transaction Switch File Structure

*<APS_HOME>\ applications\ts\webapps\ts\WEB-INF\*

```
WEB-INF
  conf     <- TS configuration files
  commands <- Managing Scripts
  data     <- Data(counters etc.)
  install  <- Installation Scripts
  lib      <- Jars directory
  logs     <- TS Logs
  system   <- System files
  temp     <- Temporary files
```

# Managing Scripts

<APS_HOME>\ applications\ts\webapps\ts\WEB-INF\commands:

**commands** `(commands for start/stop/restart… TS services)`

- **node**                     `<- commands for TS node`
  `listServices      <- List of Services`
  `refreshServiceList <- Reload service list from configuration`

- **service**
  `<Service1>     <- Service name`
  `restart        <- Restart (if configuration was changed)`
  `start          <- Start (if Service was stopped)`
  `status         <- Service current status`
  `stop           <- stop Service`
  `...            <- Custom service commands`
  `<Service2>`
  `restart`
  `start`
  `status`
  `...`
  `...`

# Configuration Files

*<APS_HOME>\applications\ts\webapps\ts\WEB-INF\conf\*

```
conf
  application        <- Configuration of common services
    boot.properties  <- initial load configuration TS
    Service1.s.xml   <- Service 1 configuration
    Service2.s.xml   <- Service 2 configuration
    ...
    Log.s.xml        <- Log service configuration
    Platform.s.xml   <- Platform service configuration
    Routing.s.xml    <- Routing Service configuration
    WAY4DB.s.xml     <- Connection to DB configuration
    ...
  node.properties    <- node configuration
  parameters.txt     <- parameters needed to be configured
```

# Example of Configuration File. POS-Controller

```xml
<?xml version="1.0" encoding="UTF-8"?>
<service xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    address = "POSNative"
    singleton="true"
    autoStarted="true"
>
    <appComponent xsi:type="POSController">
        <transport
            xsi:type="HdExternalServer"
            port="8842"
        >
            <filter
                xsi:type="BinLen"
                headerLength="2"
            />
            <filter
                xsi:type = "TermHSMSecureISO"
            />
        </transport>
      <dialect
            resource="pos_ow_native.prm"
            messageFormat="POS_ISO"
      />
    </appComponent>
    <dependency service="AcqService"/>
    <dependency service="WAY4DB"/>
</service>
```

Address – Service attribute used for routing configuration

- One address can be assigned to several services
- Several addressed can be assigned to one service

Port – physical port of TS

Dialect – determines requests format

# Routing

# Routing File. Example

*Routing file:*

<APS_HOME>\applications\<ts>\webapps\<ts>\WEBINF\conf\application\Routing.s.xml

```
<rule sourceService="AcqService"         -- /Source-service unique name and its attributes/
   protocol="iss_fp" tags="TCH:V"        -- /Target-channel code /
   targetAddress="VISA_EU_PRIMARY"       -- /address of the target service/
   name="VISA Issuer"/>                  -- /service name/
```

-----------------------------------------------------------------------

```
<rule sourceService="AcqService"
   protocol="iss_fp" tags="TCH:E"
   targetAddress="MC_EU_PRIMARY,MC_US_PRIMARY,MC_EU_SECONDARY,MC_US_SECONDARY"
   name="MasterCard Issuer"/>
```

-----------------------------------------------------------------------

- *Transaction Switch sends a request to found* targetAddress

# Message Channels

OpenWay\Full\Configuration Setup\Main Tables\Message Channels

## Message Channels

| | Name | Code | Is On Us | Contra Channel |
|---|---|---|---|---|
| ▷ | RBS | B | Affiliated | Internal |
| 2 | Affiliated | m | Affiliated | |
| 3 | H2H Clearing | o | Affiliated | |
| 4 | Diners Club | C | No | |
| 5 | MasterCard SMS | D | No | |
| 6 | MasterCard (IPM) | E | No | Our MC Cards |
| 7 | SWIFT | F | No | |
| 8 | RKC | G | No | |
| 9 | CUP | H | No | Our CUP Cards |
| 10 | VISA NSPK | I | No | Our VISA Cards |
| 11 | JCB | J | No | Our JCB Cards |
| 12 | VISA SMS NSPK | K | No | Our VISA Cards |
| 13 | Diners Club ATM | L | No | |
| 14 | MasterCard NSPK | M | No | Our MC Cards |
| 15 | VISA SMS | S | No | |
| 16 | Union Card | U | No | |
| 17 | VISA | V | No | Our VISA Cards |
| 18 | NSPK | W | No | Our NSPK Cards |
| 19 | AMEX | X | No | Our AMEX Cards |
| 20 | AMEX Debit | Y | No | |
| 21 | MasterCard MasterCom | c | No | |
| 22 | SEPA | s | No | |
| 23 | Our NSPK Cards | w | No | NSPK |
| 24 | Our ATM | A | Yes | |
| 25 | Internal | O | Yes | Affiliated |
| 26 | Our POS | P | Yes | |
| 27 | Our MC Cards | e | Yes | MasterCard (IPM) |
| 28 | Our CUP Cards | h | Yes | CUP |
| 29 | Our JCB Cards | j | Yes | JCB |
| 30 | Our Infokiosk | k | Yes | |
| 31 | Our Union Card Cards | u | Yes | Union Card |

*The Message Channels dictionary is used to define identifiers of logical routes (channels) in WAY4. These identifiers serve to select rules for processing transaction information.*

# Transaction Switch Logs

# Transaction Switch Logs

- *Log-service configuration:*

  &lt;APS_HOME&gt;\applications\&lt;ts&gt;\webapps\&lt;ts&gt;\WEB-INF\conf\application\Log.s.xml

- *Location:*

  &lt;APS_HOME&gt;\applications\&lt;ts&gt;\webapps\&lt;ts&gt;\WEB-INF\logs\

- *Types of logs*
  - bootstrap_*.log
    - Information on initial load
  - base_*.log
    - Errors, warnings and non-transactional messages
  - ext_*.log
    - Transactional messages, debug messages etc.

# TS Logs Analysis

```
....
2018-06-03 17:38:52.680 I TokheimH2H To.H_I70 00141540000F8PD
TokheimH2H *==> hsm_protocol.HSM.VerifyMAC (59999ms)
...
```

**"2018-06-03 17:38:52.680" –**   date and time of request
**"I"** – Log level (E – error, W – warning, L – log, I – info, D – debug)
**"TokheimH2H"** –  Service name

**"TokheimH2H"** – Source

**"*==>"**   request direction (from source)

**"hsm_protocol"** – Protocol name

**"HSM"** – Target address

**"VerifyMAC"** – Function

**"(59999ms)"** – Timeout

# Management Console

# Management Console of Application Server

## Management Console

| Applications | Services | Configurations |
| --- | --- | --- |

Filter by...

| Application | Start Time | Restarts | Status |
| --- | --- | --- | --- |
| logagent | | | ↓ |
| monitoring | | | ↓ |
| ts | 15-11-10 16:59 | | ↑ |

## Management Console

admin logout

| Applications | Services | Configurations |
| --- | --- | --- |

Filter by...

| Service | Application Filter by... | Status | Config File | |
| --- | --- | --- | --- | --- |
| AcqDB | TransactionSwitch | ↑ | conf/application/AcqDB.s.xml | ☐ |
| AcqService | TransactionSwitch | ↑ | conf/application/AcqService.s.xml | ☐ |
| AuthService | TransactionSwitch | ↑ | conf/application/AuthService.s.xml | ☐ |
| BGWAdapter | TransactionSwitch | ↑ | conf/application/BGWAdapter.s.xml | ☐ |
| BGWSaf | TransactionSwitch | ↑ | conf/application/BGWSaf.s.xml | ☐ |
| EchoTest | TransactionSwitch | ↑ | conf/application/EchoTest.s.xml | ☐ |
| HSMAdapter | TransactionSwitch | ↓ | conf/application/HSMAdapter.s.xml | ☐ |
| HsmTest | TransactionSwitch | ↑ | conf/application/HsmTest.s.xml | ☐ |
| IntraLnkAdapter | TransactionSwitch | ↑ | conf/application/IntraLnkAdapter.s.xml | ☐ |
| IssDB | TransactionSwitch | ↑ | conf/application/IssDB.s.xml | ☐ |
| Log | TransactionSwitch | ↑ | conf/application/Log.s.xml | ☐ |
| Platform | TransactionSwitch | ↑ | conf/application/Platform.s.xml | ☐ |
| POSHypercom | TransactionSwitch | ↓ | conf/application/POSHypercom.s.xml | ☐ |
| POSNative | TransactionSwitch | ↑ | conf/application/POSNative.s.xml | ☐ |
| POSNativeBig | TransactionSwitch | ↓ | conf/application/POSNativeBig.s.xml | ☐ |
| Routing | TransactionSwitch | ↑ | conf/application/Routing.s.xml | ☐ |
| WAY4DB | TransactionSwitch | ↑ | conf/application/WAY4DB.s.xml | ☐ |

# TS Configuration Using Management Console

# TS Logs in the Management Console

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