Network Management
Clarifications

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v04

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Open Question from Past IA-ME Discussions

Why model Provisioning as a separate <u>functional</u> entity?

- → Because it is an often **existing entity** in **today**‘s network configuration workflows
- → Even more importantly: It is a **common entity** to all TSN configuration models

(see next slides)

802.1Qcc - Fully centralized model

Task: “set up TSN-enabled converged network”
- For Stream traffic **and**
- For non-Stream traffic

Task: “set up path (incl. resource allocation)”
- Stream traffic **only**

Based on:
- IEEE Managed Object definitions and
- Standard Network Management Protocol

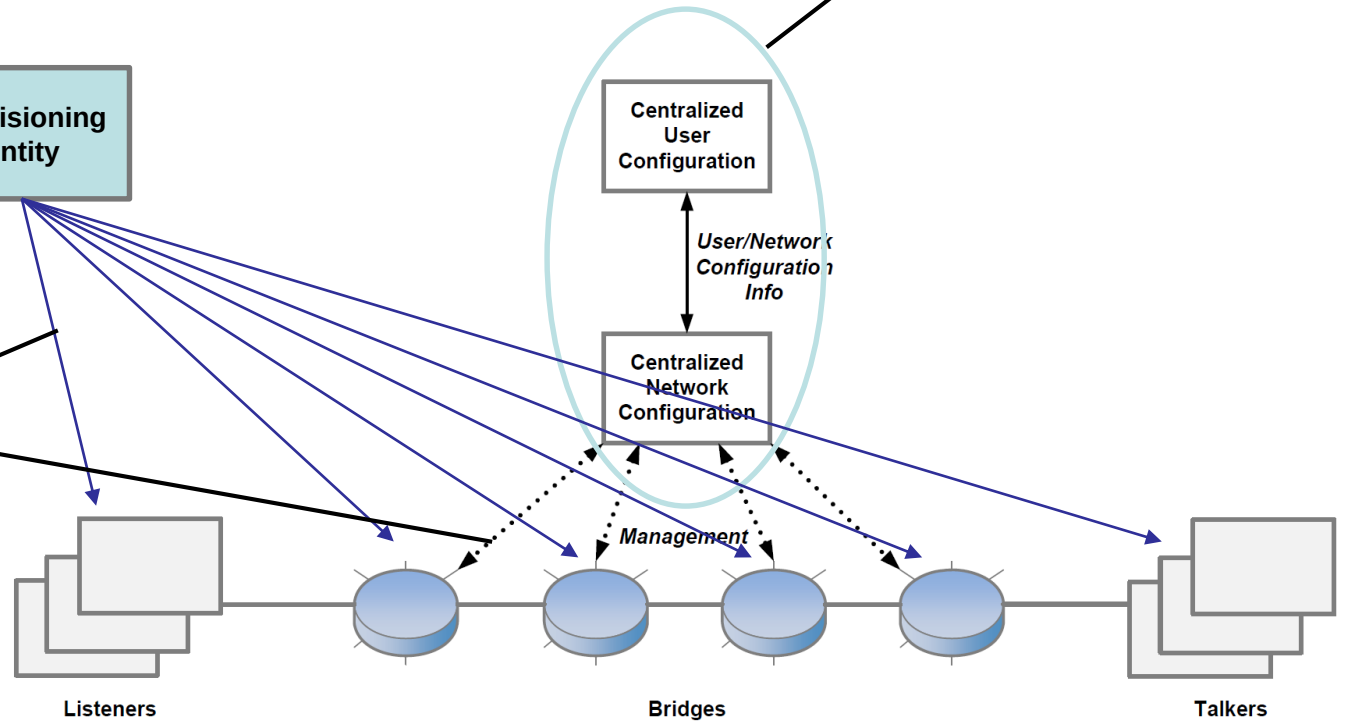

Figure 46-3—Fully centralized model

802.1Qcc - Fully centralized model
(update from Oct 30th, 2020 60802 System Spec Meeting)

Task: “set up path (incl. resource allocation)”
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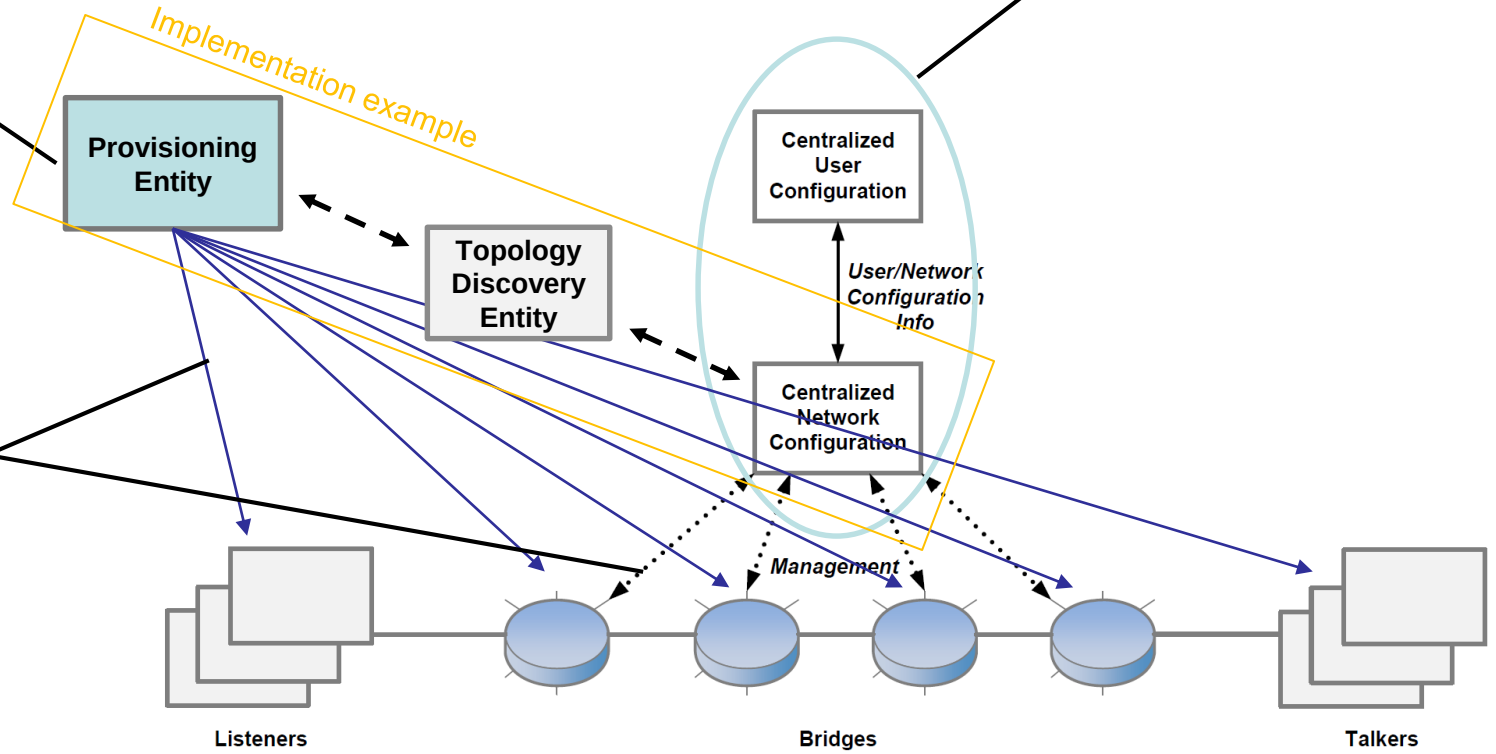

Figure 46-3—Fully centralized model

802.1Qcc - Fully distributed model

Task: “set up TSN-enabled converged network”
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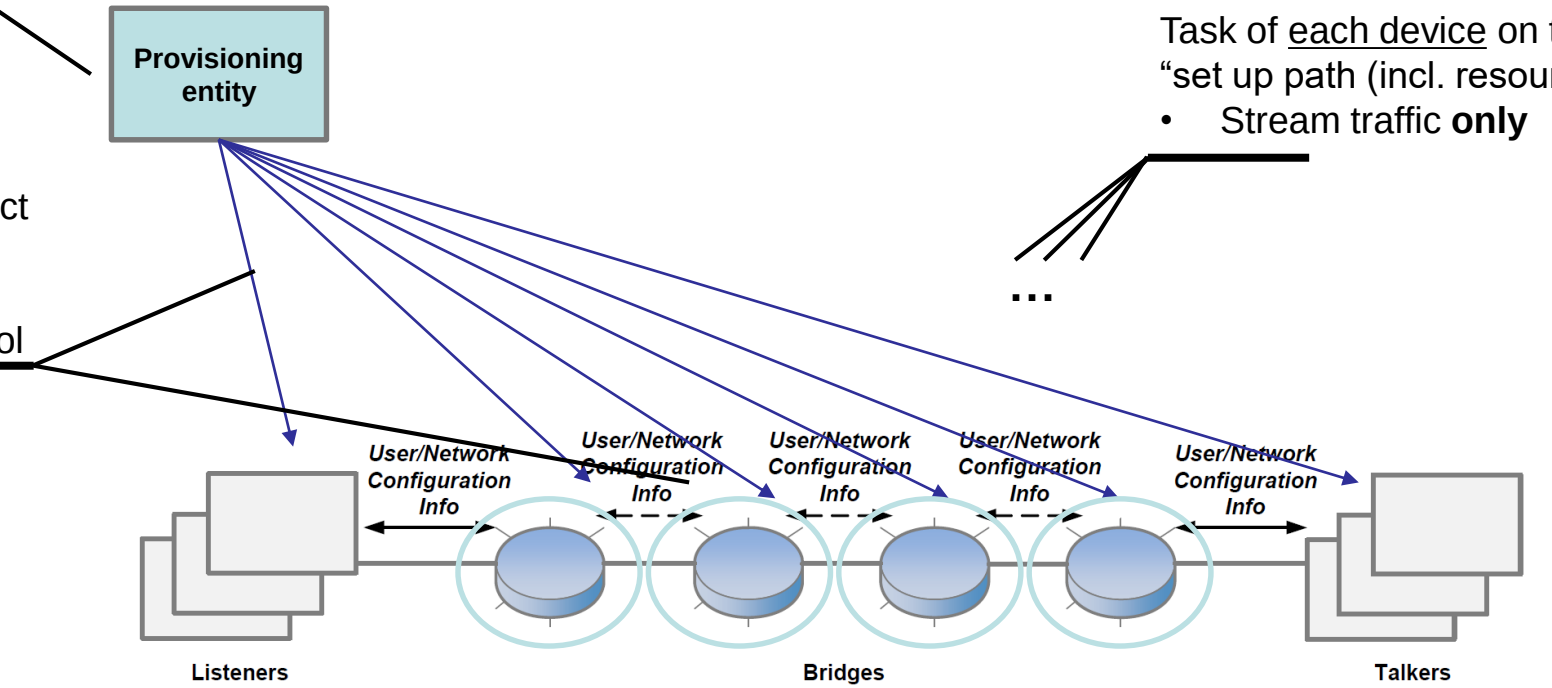

Figure 46-1—Fully distributed model

802.1Qcc - Centralized network/distributed user model

Task: “set up TSN-enabled converged network”
- For Stream traffic **and**
- For non-Stream traffic

Task: “set up path (incl. resource allocation)”
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Based on:
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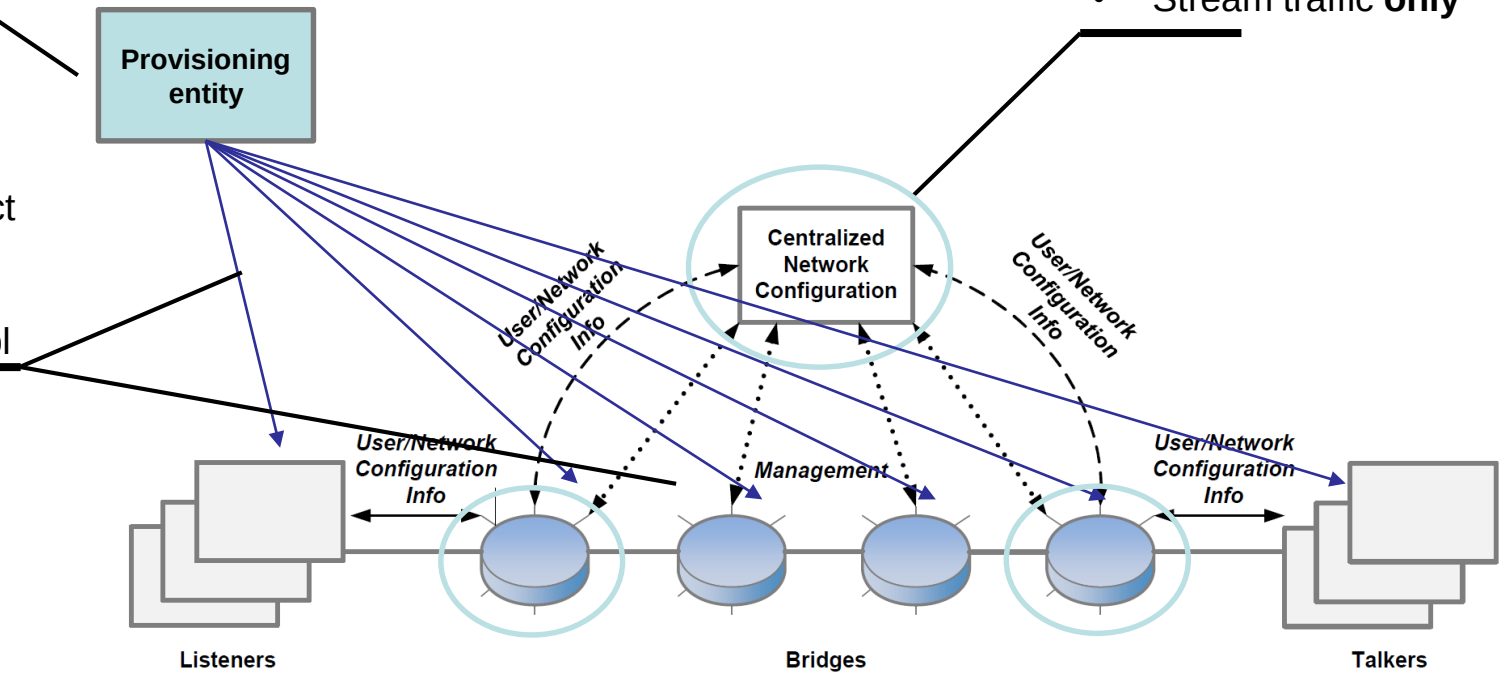
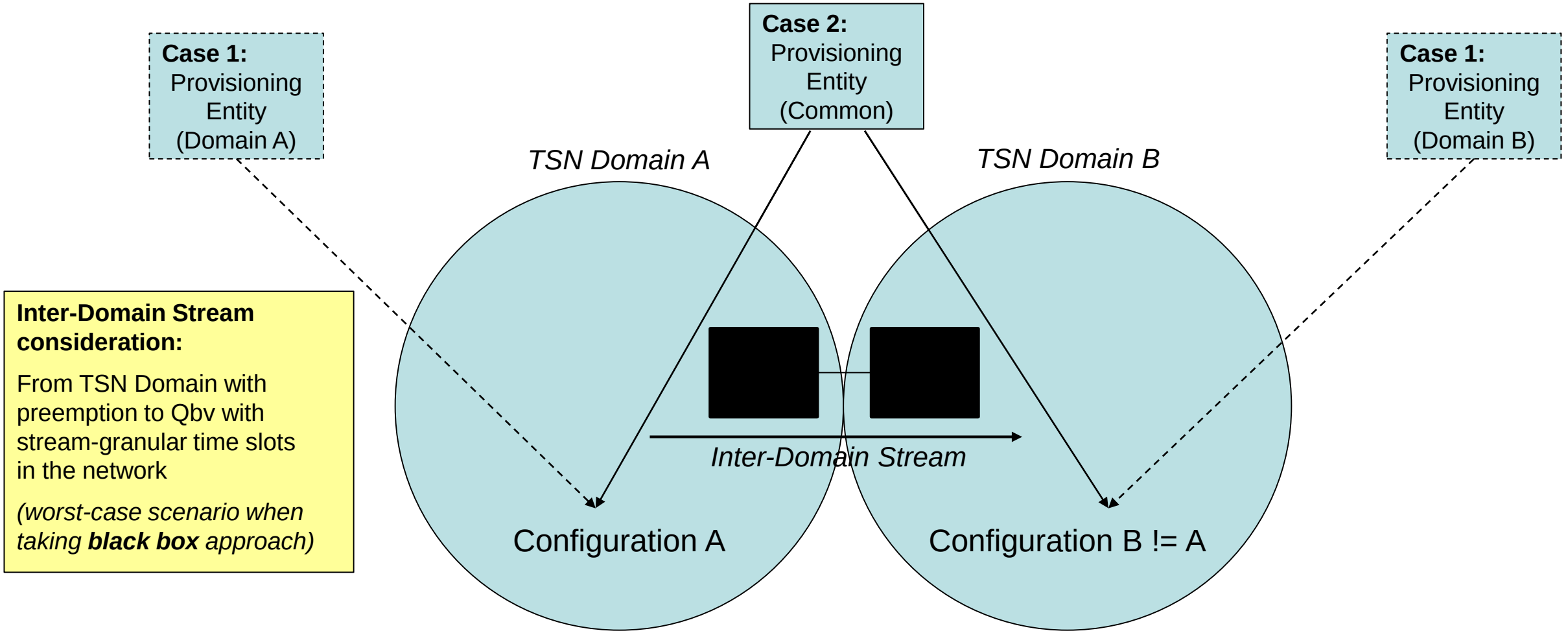


Figure 46-2—Centralized network/distributed user model

Inter-Domain TSN Streams Considerations in Context of Provisioning Entity (created during Oct 30th, 2020 60802 System Spec Meeting)



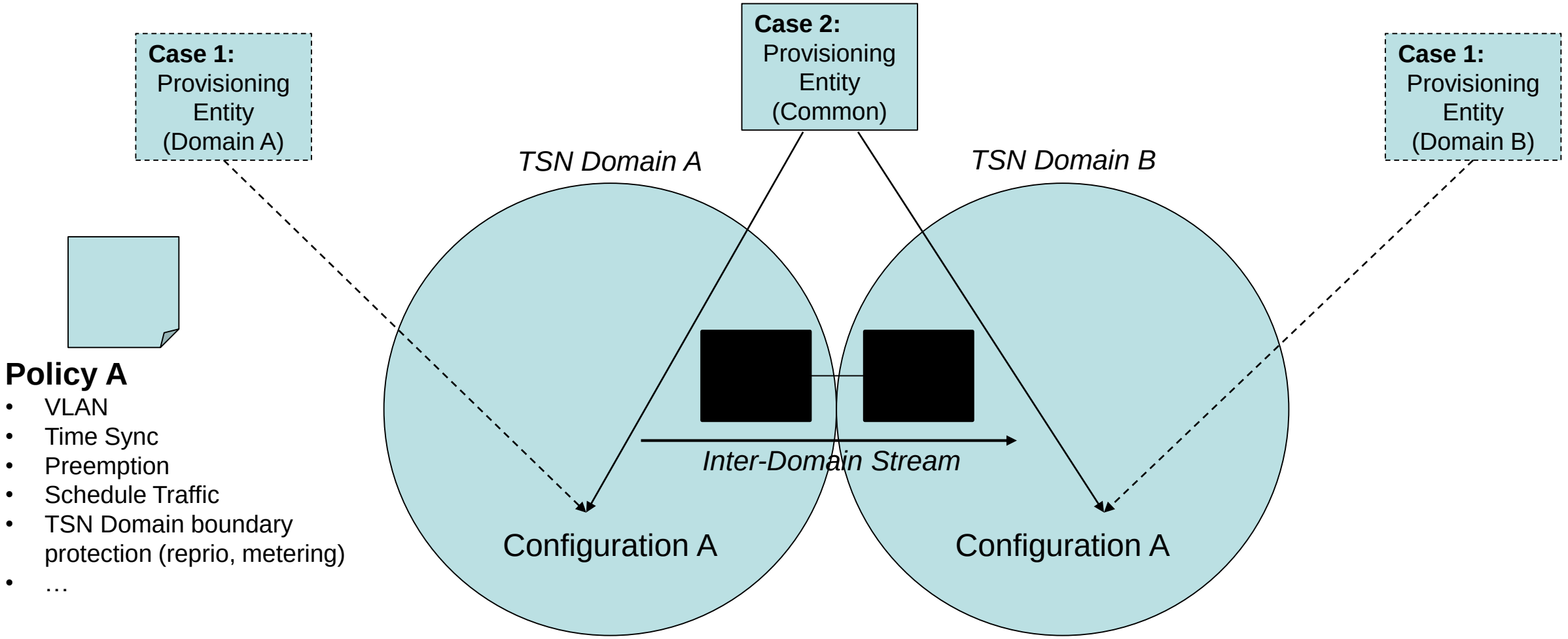
Inter-Domain Stream consideration:

From TSN Domain with preemption to Qbv with stream-granular time slots in the network

*(worst-case scenario when taking **black box** approach)*

- Same Provisioning Entity may still result in different policies being active in different TSN Domains
- Generic inter-domain communication only possible with proxies at the domain boundaries

Inter-Domain TSN Streams, Provisioning Entity, and Network Policy (created during Oct 30th, 2020 60802 System Spec Meeting)



- Same policies lead to same TSN Domain configuration, which may allow merging of Domains or alternatively eases Inter-Domain Communication

Open Question from Past IA-ME Discussions

What does the Provisioning Entity configure exactly?

- Next slide focuses on **TSN Domain**, **VLANs** and **Time Sync**
- Additional aspects may need to be configured as well, e.g. Preemption, Qbv, etc.

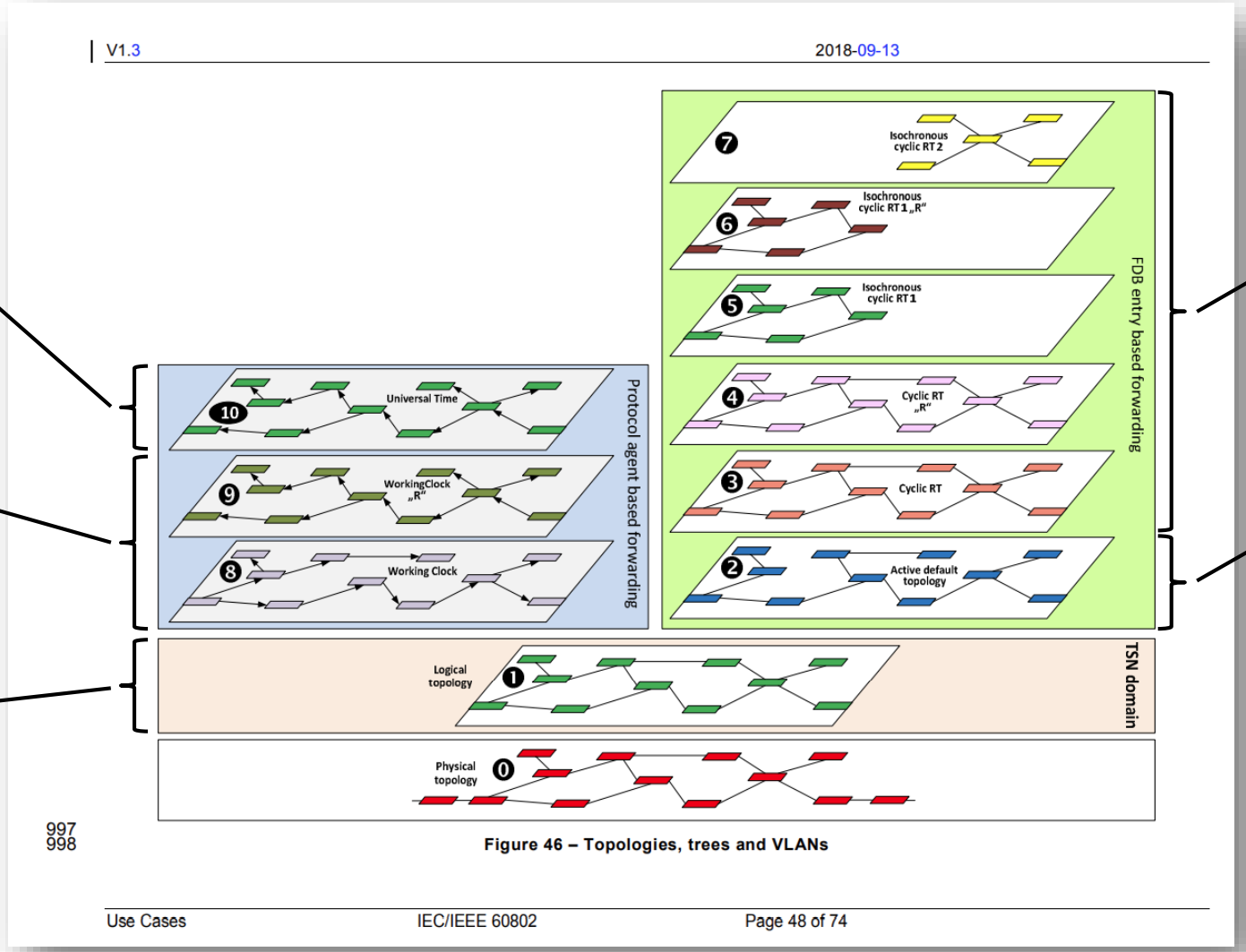
TSN Domain, VLANs, and Time Sync Provisioning

Tasks of the Provisioning Entity:

Set up gPTP Domain(s) under control of BMCA

Set up gPTP Domain(s) under control of Provisioning Entity

Set up a Station's TSN Domain ID



Source: [60802-industrial-use-cases-0918-v13]

Set up **Stream VLAN(s)** with TE-MSTID
- Learning disabled
- Default drop

→ CNC controls paths (FDB)

Set up **Non-Stream VLAN(s)** with STP
- Learning enabled
- Default flood

→ STP controls paths (ports)

Stream Reservation:
In centralized model, CNC maps TSN Streams into Stream VLANs by…
- *Adding Stream DA to FDB for on-path Bridges*
- *Returning Stream DA, VLAN ID and PCP for TSN Stream to CUC*
- *Policy-specific: Qbv config, etc.*

TSN Domain, VLANs, and Time Sync Provisioning

(with addition of Open Points from Nov 12th, 2020 60802 System Spec Meeting)

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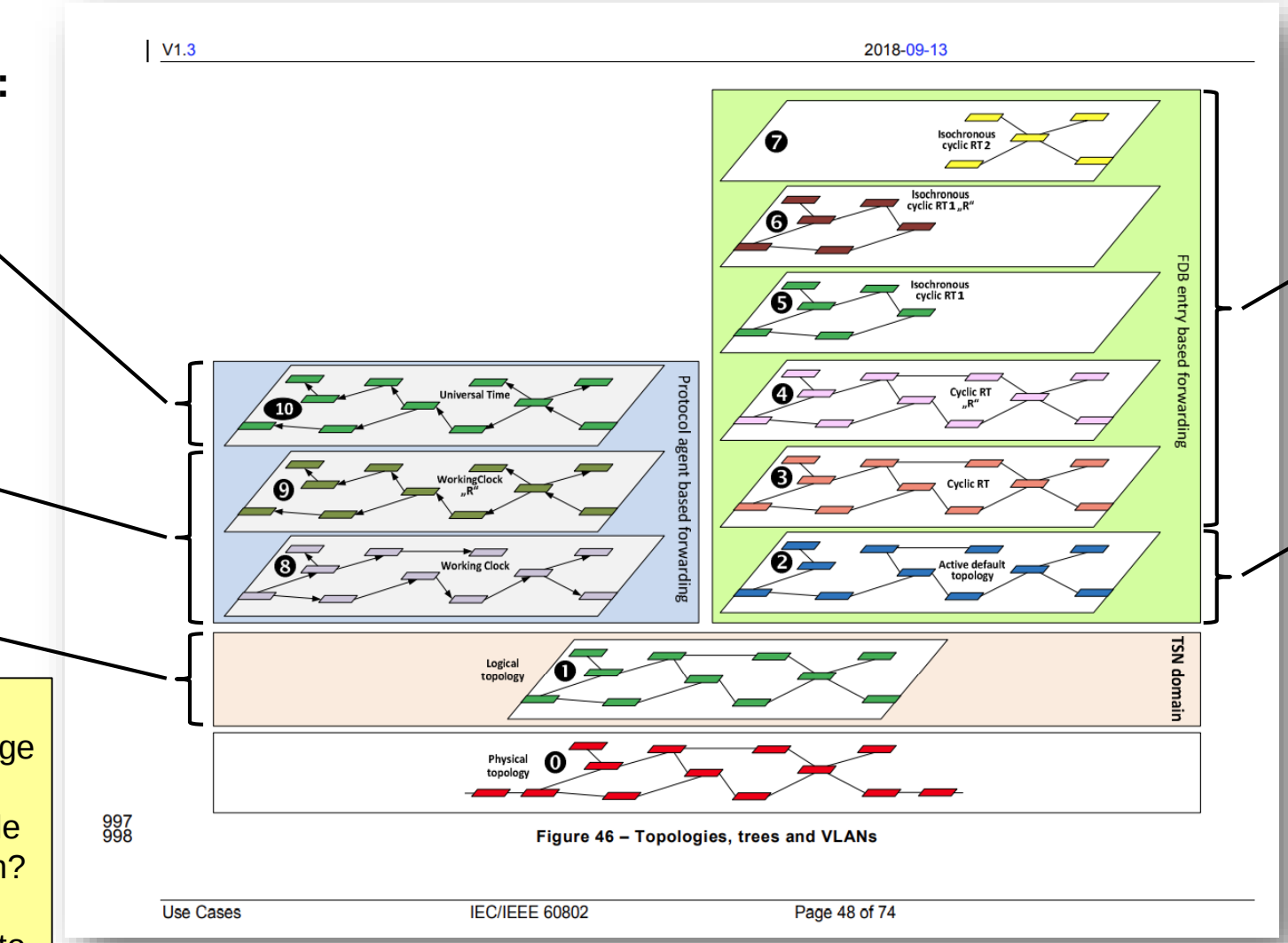

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Open Points:
- Which entity(ies) manage Stream DAs?
- Which entity responsible for topology information?
- Who defines Policies?
- How do Policies relate to the 60802 Ind. Profile?

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TSN Domain, VLANs, and Time Sync Provisioning

(with updates of Open Points from Nov 13th, 2020 60802 System Spec Meeting)

Tasks of the Provisioning Entity:

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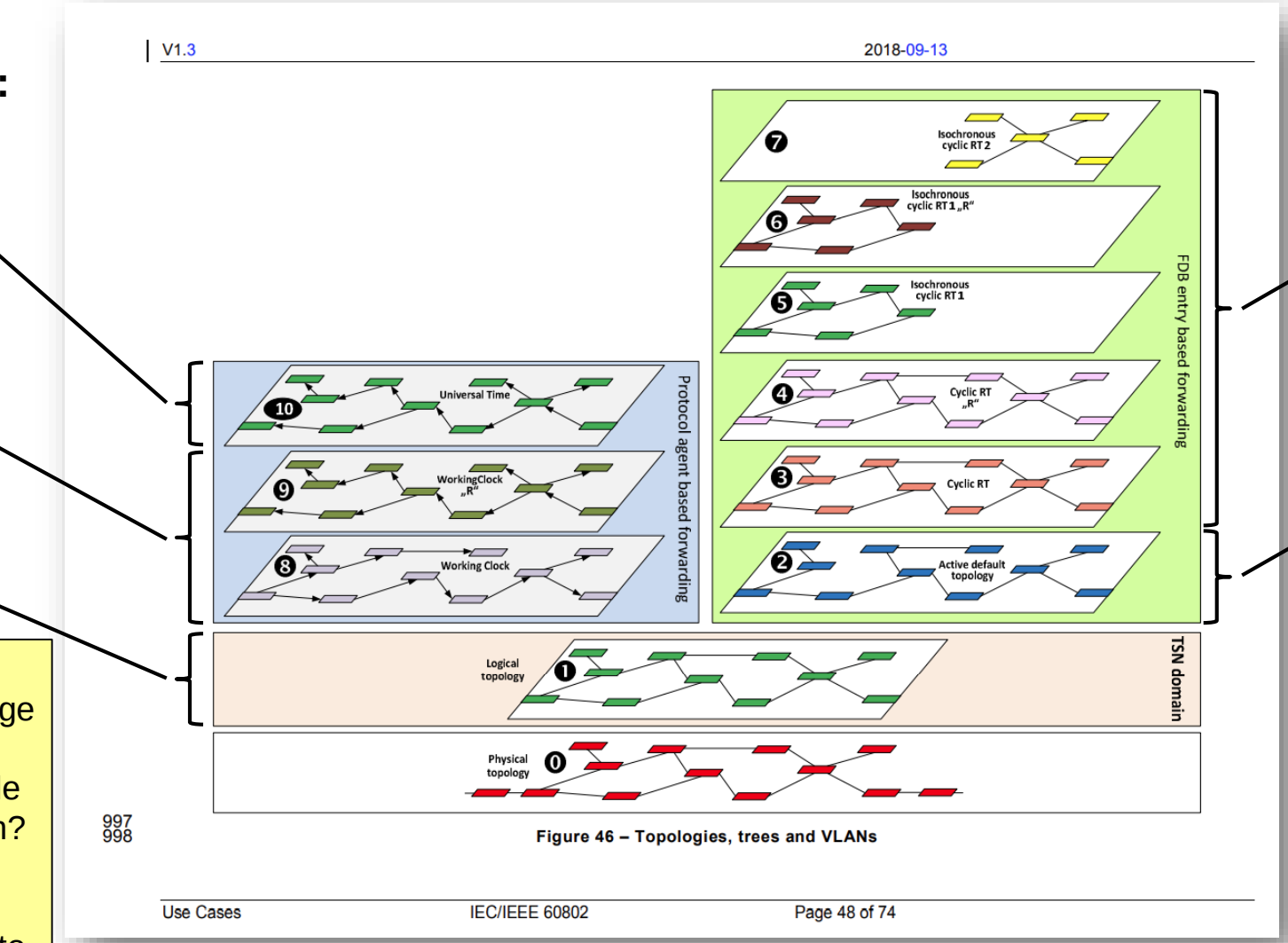

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Open Points:

- Which entity(ies) manage Stream DAs? → *CNC*
- Which entity responsible for topology information? → *TDE*
- Who defines Policies?
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Thank you!

Questions?