TSN Network Configuration Entity

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Preliminary Notes

- This presentation is just an input to group discussion.
- The consideration this presentation aims to bring up is consistency in TSN standards, e.g., in relation to existing definitions and so on.
- This presentation is an elaboration of the considerations pointed out in the last slides in https://www.ieee802.org/1/files/public/docs2021/60802-farkas-tsn-configuration-0421-v01.pdf.

Background – CNC in IEEE Std 802.1Qcc-2018

- "The CNC has a **complete view of the physical topology** of the network as well as the capabilities of each Bridge."

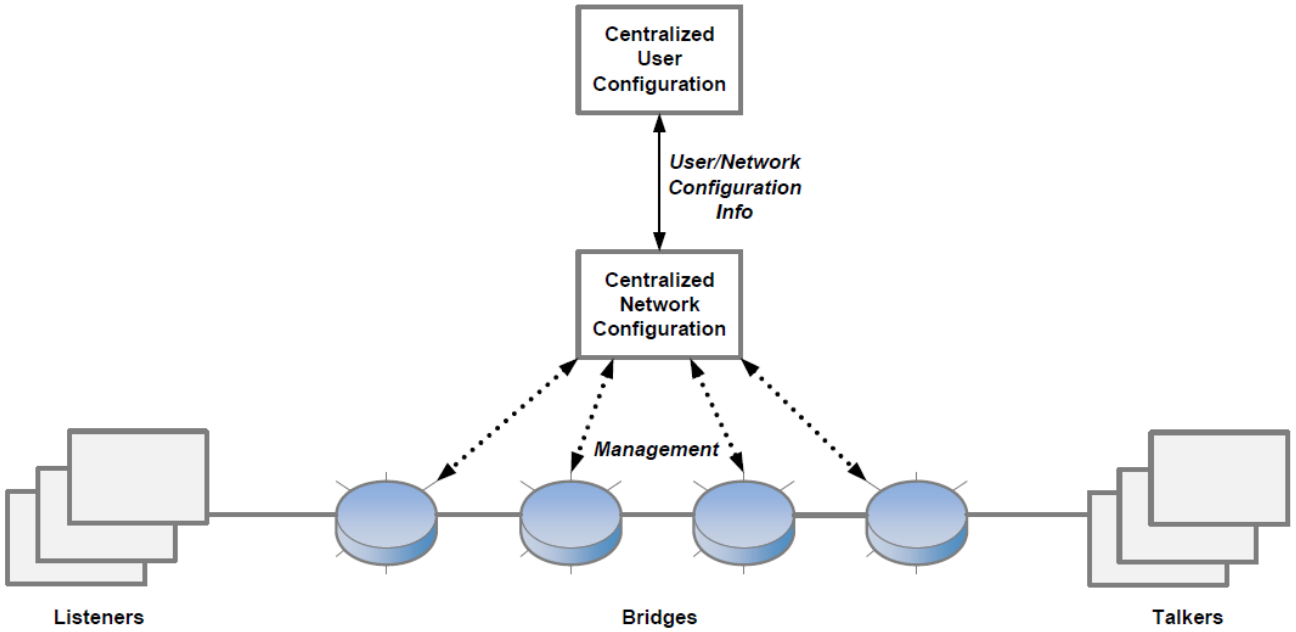


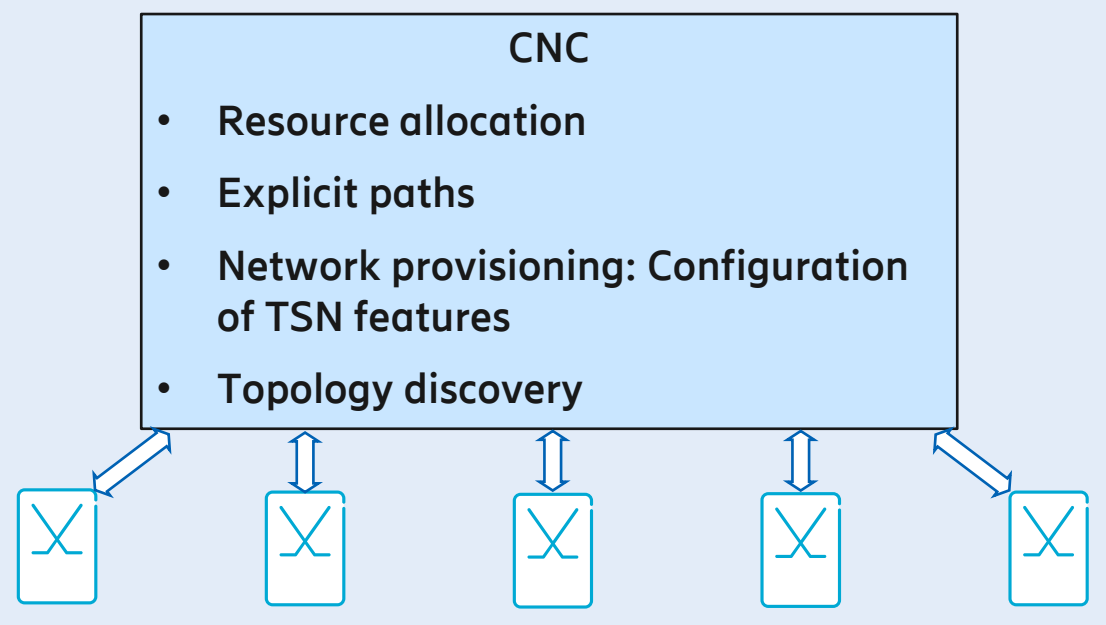
Figure 46-3—Fully centralized model

- "In the figure, the dotted arrows represent the **remote network management** protocol. The CNC acts as the management client, and each Bridge acts as the management server. The CNC uses **remote management to discover physical topology**, retrieve Bridge capabilities, and **configure TSN features** in each Bridge. Talkers and Listeners are not required to participate in this remote network management protocol. The information carried by the remote network management protocol is specified in Clause 12."

- **Note the relationship between management and configuration.**

Background – CNC Functions

- "The CNC has a **complete view of the physical topology** of the network as well as the capabilities of each Bridge."

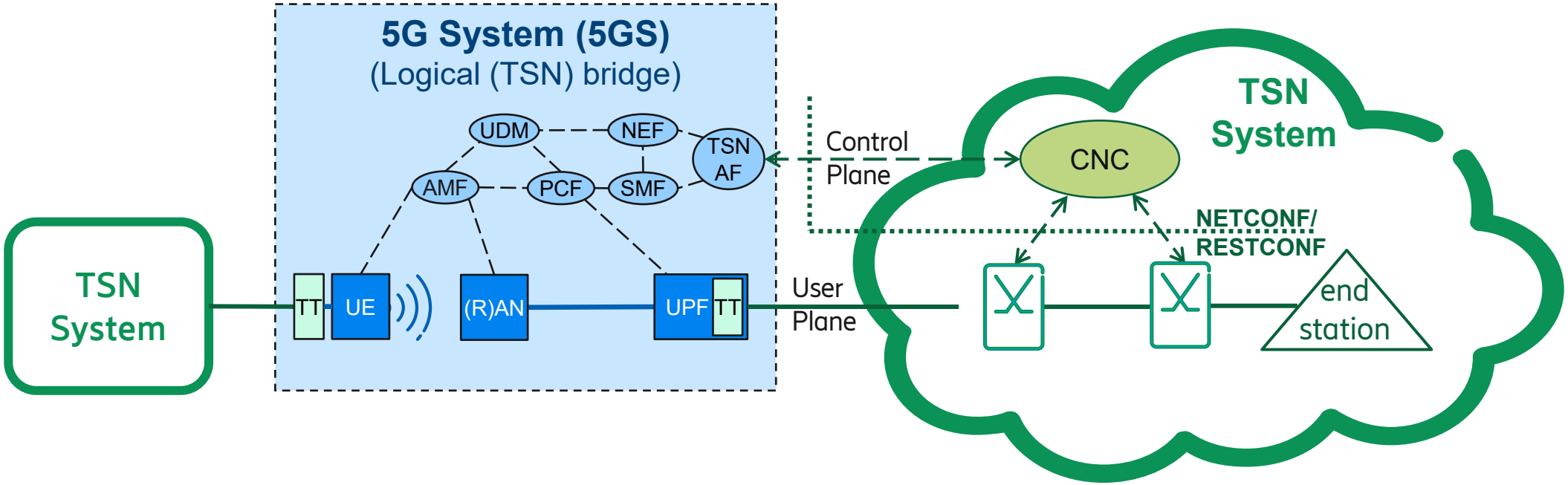


- "In the figure, the dotted arrows represent the **remote network management** protocol. The CNC acts as the management client, and each Bridge acts as the management server. The CNC uses **remote management to discover physical topology**, retrieve Bridge capabilities, and **configure TSN features** in each Bridge. Talkers and Listeners are not required to participate in this remote network management protocol. The information carried by the remote network management protocol is specified in Clause 12."

- **Note the relationship between management and configuration.**

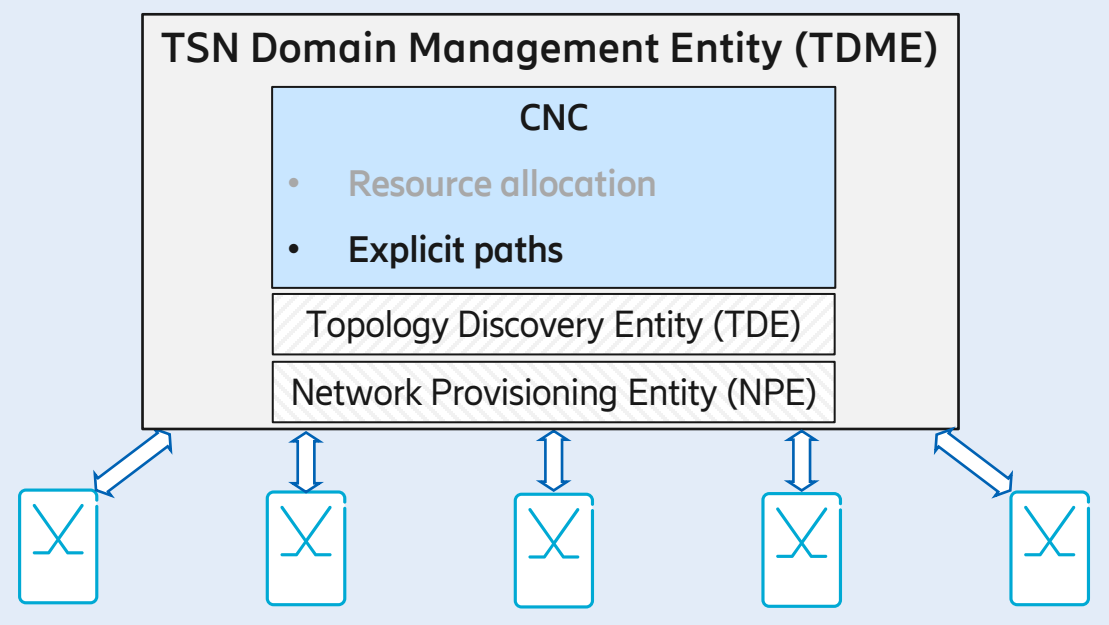
Other Standards Build Upon TSN Standards, e.g.: 3GPP 23.501

- LS on TSN support in 3GPP Release-16 stage 2 completion https://www.ieee802.org/1/files/public/docs2020/liaison-3GPP-S2-2003508-TSN-0420.pdf
- Based on *Figure 4.4.8.2-1: System architecture view with 5GS appearing as TSN bridge* in 3GPP 23.501:



Current Draft Approach in 60802

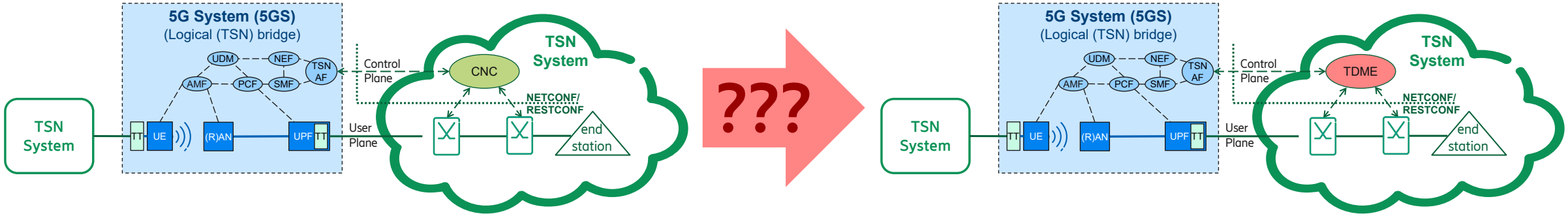
- https://www.ieee802.org/1/files/private/60802-drafts/d1/60802-Steindl-Clause6Subclause8-0221-v6-clean.pdf
- "The TDME is responsible for the network **configuration** using **remote management**."



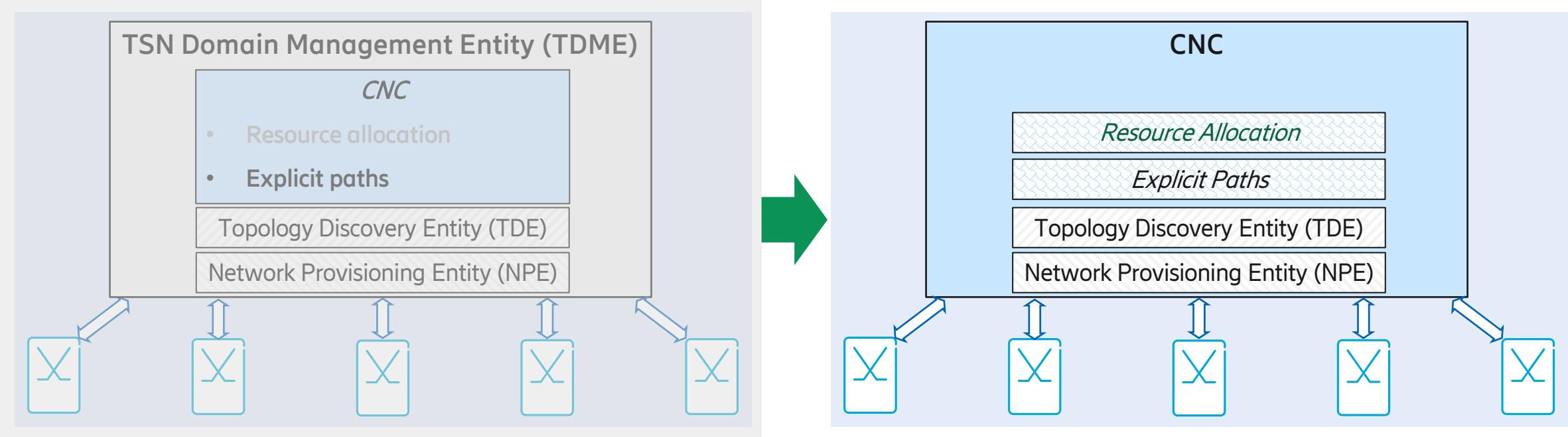
- "It can also perform topology discovery using the Topology Discovery Entity (TDE); establish explicit paths through the network using the CNC."
- "The roles of the CUC and CNC remain as defined in IEEE Std 802.1Qcc-2018"
  - However, topology discovery is part of the CNC in IEEE Std 802.1Qcc-2018, see above.

Should Other Standards Be Updated? Potentially Per TSN Profile?

- For instance, should *Figure 4.4.8.2-1: System architecture view with 5GS appearing as TSN bridge* in 3GPP 23.501 be updated along the lines below if 5G is used in industrial automation???

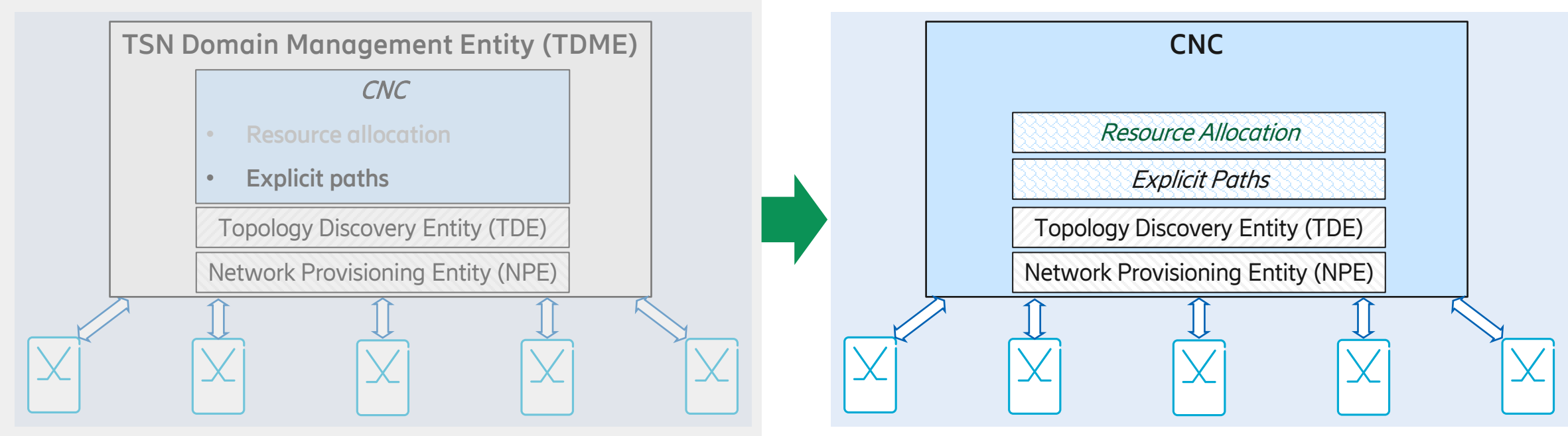


Proposal for IEC/IEEE 60802



- Go back to IEEE Std 802.1Qcc-2018
- Maintain the "externally observable" part as specified by 802.1Qcc.
  - For instance, the CNC is the entity that is responsible for **topology discovery** and network **configuration** of **TSN features** using **remote management**.
- Refine internal details as needed
  - For instance, the CNC includes Topology Discovery Entity (TDE) to perform **topology discovery**

NOTE



- The job to be done is the same.
- The functions to do the job are the same.
- "packaging" of the functions is what is different and labeling of the functions may be different.

Thank you!