Conflict Management(Phase 1)
via E2 Guidance
DIRECT CONFLICT

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Conflict Manager-Overview:

- This module shall be responsible for resolving potentially overlapping or conflicting requests from multiple xApps.

- E.g., the user needs to be moved from one cell to another due to high traffic load, while the other xApp at the same time may want to move the user back as the handover boundary change due to a high handover failure rate.

- In such a case the individual user will be „ping-ponged" between the two cells if we don't have a conflict mitigation function that looks at what's happening in the network and what impact the potential action may have on the network operation if being executed in the E2-Node. In such an example the conflict mitigation function's job is to align the potential actions to avoid such undesired behaviour.

Supported Use case

Direct Conflicts: The conflicts can be observed directly by Conflict Mitigation. Supported Use case:

- Two or more xApps request different settings for the very same configuration of one or more parameters of a Control Target. Conflict mitigation processes the requests and decides on a resolution.

E2 Guidance: xApp initiated conflict mitigation using E2 Guidance to obtain guidance from Conflict Manager to resolve potential conflicts prior to initiating a RIC function procedure;

-- RIC Control using E2 Related API: E2 Guidance (request, response).

E2 Guidance

- The purpose of the xApp initiated E2 Guidance request/response API procedure in the Near-RT RIC is to allow xApp to obtain guidance from the Conflict Manager platform function prior to initiating an action.

- Guidance/Response from Conflict Manager shall include indication on whether the xApp proposed E2 Related API message or series of messages may result in a conflict with E2 related API messages from other xApps

- E2 guidance request/response is sent/received via gRPC

- This procedure shall be optional for xApp

E2 Guidance APIs

E2_GUIDANCE_REQ

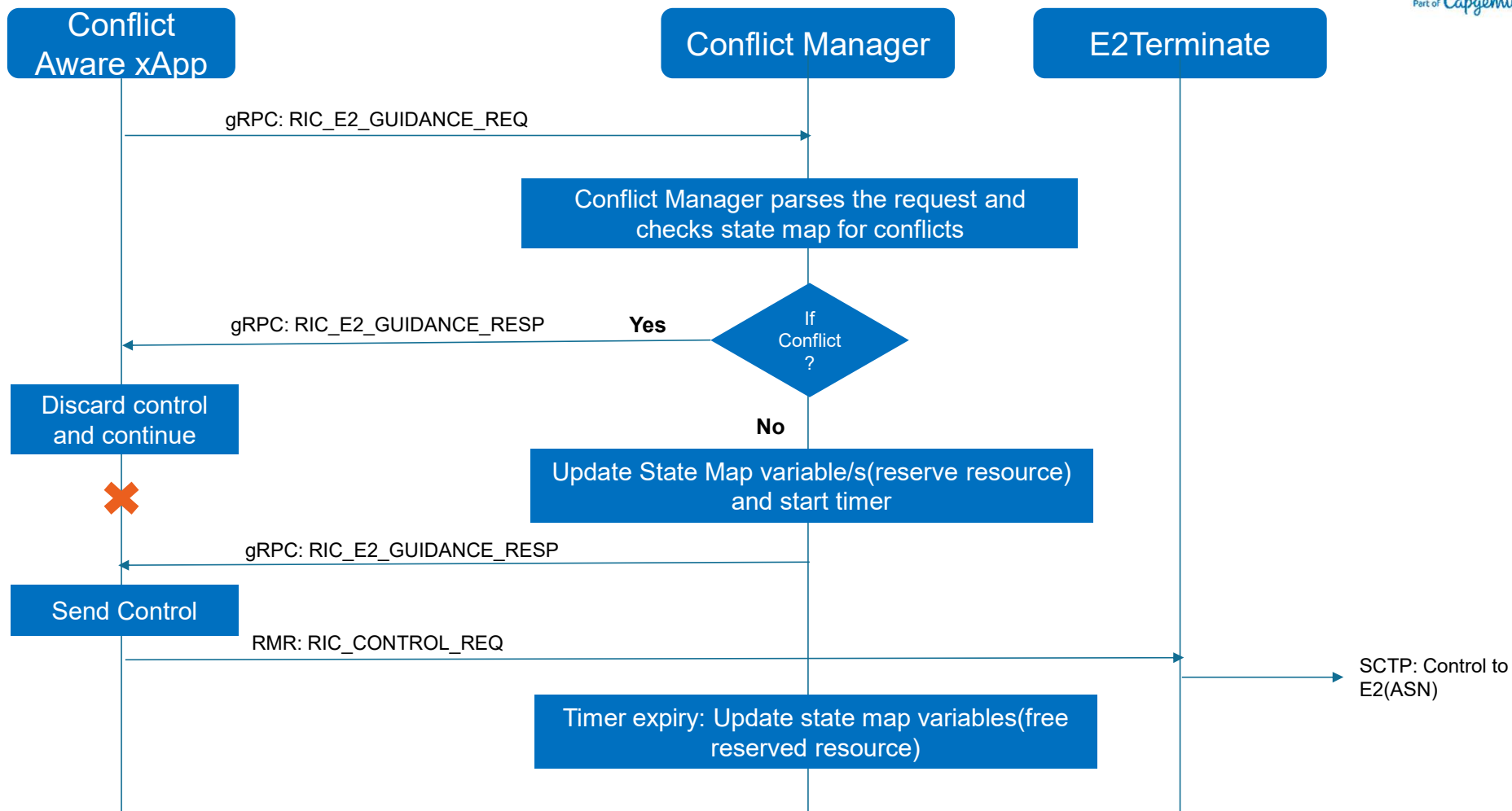| IE Name	Remarks
*ResourceType	This is an Enum to identify request type 0: UE, (1: CELL, 2: SLICE, etc.)
*TransactionID	This a 64bit integer, a unique identifier for a request. This is unique to xApp
* ResourceID	This is 64 bit integer, which uniquely identify the target resource, (eg:- For UE/Type 0 it is 64bit int AmfUENGAPID,)
* ParamList	List of configurable ran parameters control request supposed to update

E2_GUIDANCE_RESP

IE Name	Remarks
*TransactionID	This a 64bit integer, a unique identifier for a request. Same as E2_GUIDANCE_REQ
*isRequestConflicting	Boolean – True: if it may cause a conflict, false if no conflict
ConflictingParamList (Optional)	Optional (For xApp' s debugging and logs) list of conflicting Ran Params
Cause (Optional)	Optional (For xapps debugging and logs) String explaining response or remark

Conflict Manager: Approach

- xApp checks with conflict manager before sending control request(optional).

- Conflict Manager starts gRPC server for listening to RIC_E2_GUIDANCE_REQ

- Conflict manager maintains a map of available Resources (UEs, Cells, Slices etc). It updates map using data from E2_GUIDANCE_REQ

- Conflict manager parses the request and checks the map to determine if this request is conflicting with any previous request.

- Conflict manager sends RIC_E2_GUIDANCE_RESP via gRPC

- If request is non-conflicting then we update the map(reserve the resource) and send appropriate response and start a timer

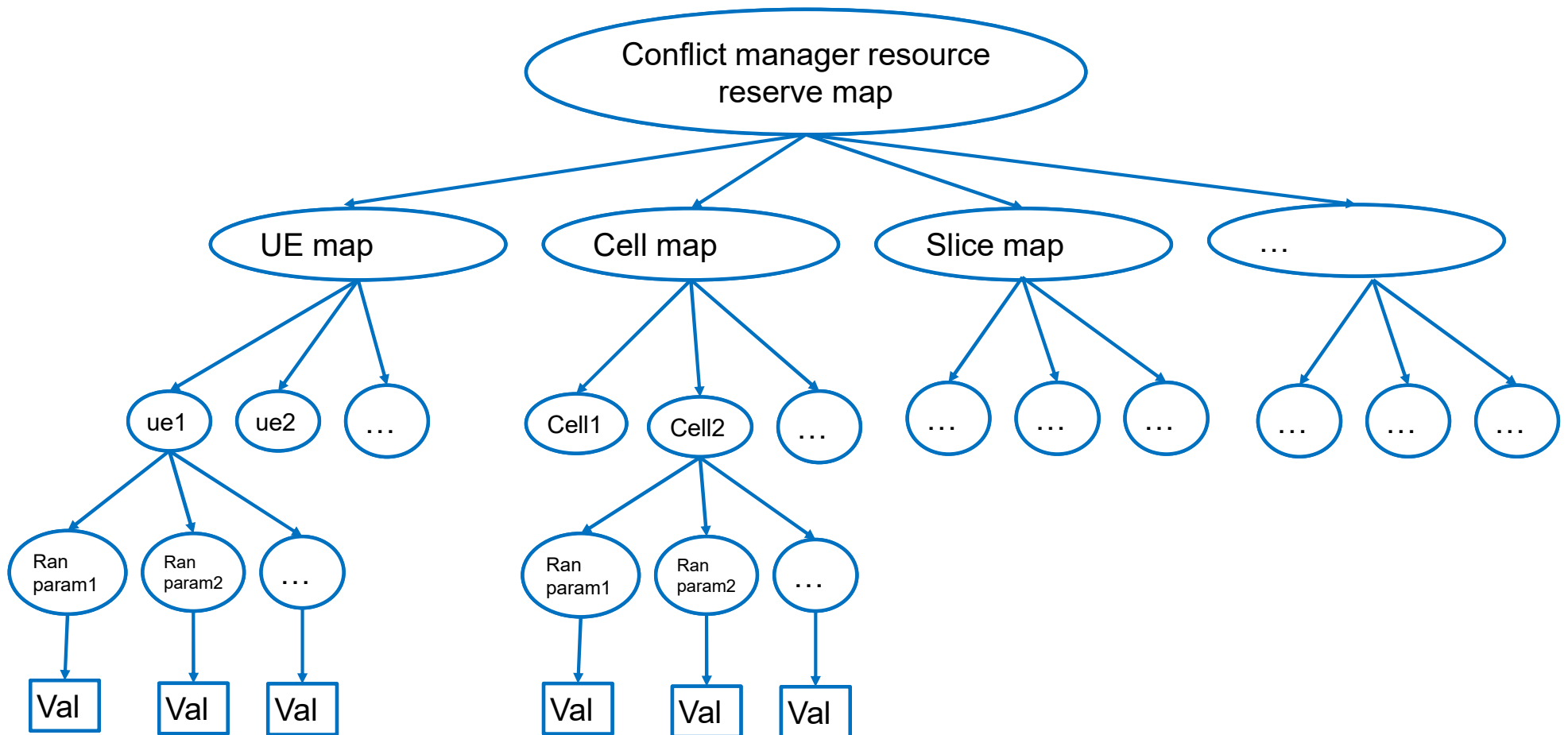- Reserved resource will be released after the timer expiry (configurable)

Conflict Manager: Workflow

Conflict Aware xApp | **Conflict Manager** | **E2Terminate**

gRPC: RIC_E2_GUIDANCE_REQ

Conflict Manager parses the request and checks state map for conflicts

If Conflict ?

Yes — gRPC: RIC_E2_GUIDANCE_RESP

Discard control and continue

No

Update State Map variable/s(reserve resource) and start timer

gRPC: RIC_E2_GUIDANCE_RESP

Send Control

RMR: RIC_CONTROL_REQ

SCTP: Control to E2(ASN)

Timer expiry: Update state map variables(free reserved resource)

Impact On Other Components

Component	Remarks
xApp Framework	Add code for gRPC server/client and proto for E2_GUIDANCE Add interface for E2_GUIDANCE_REQ and E2_GUIDANCE_RESP messages

Resource reserve map

Q & A

Thank you

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