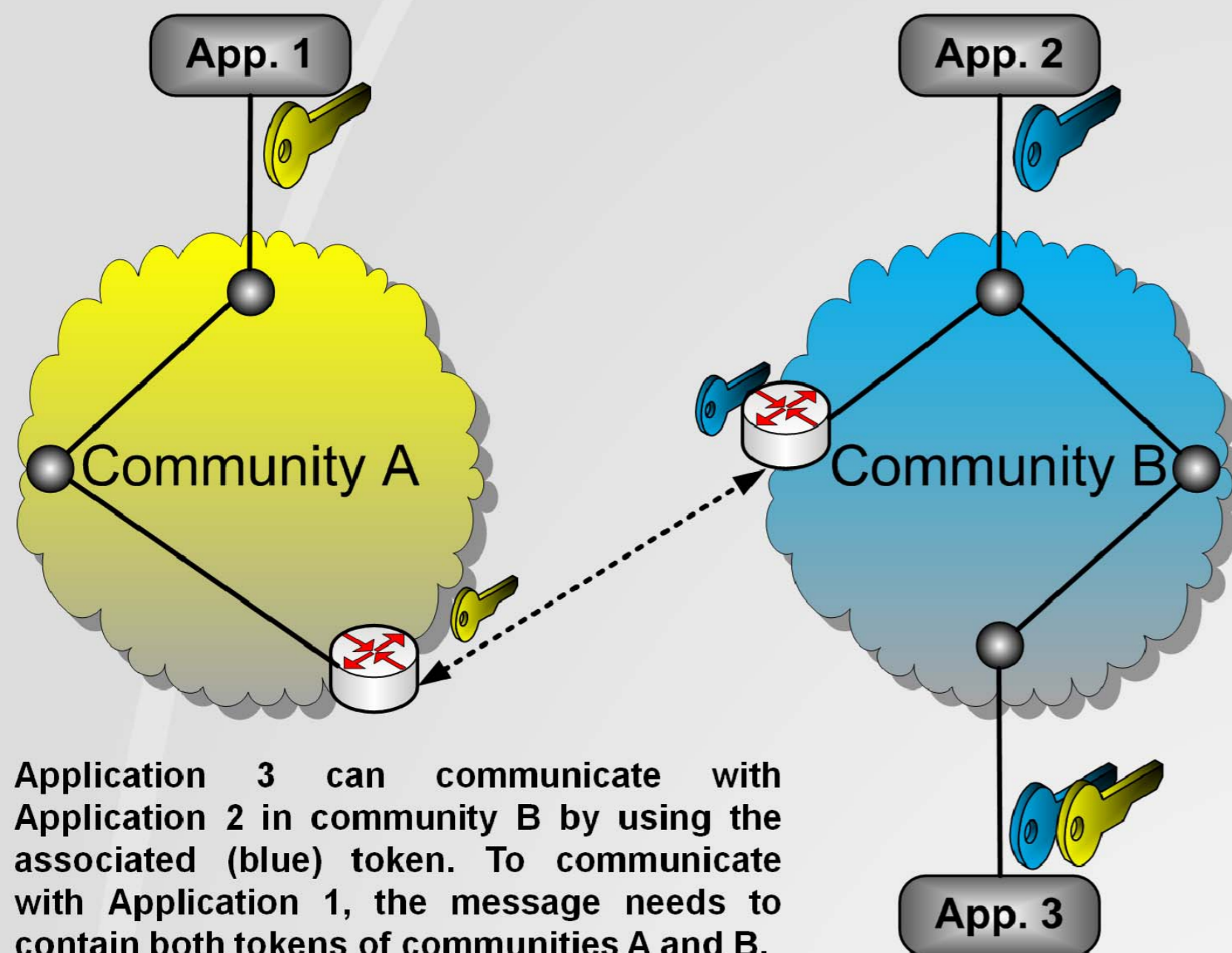




Supporting Communities in Programmable Grid Networks: gTBN



Application 3 can communicate with Application 2 in community B by using the associated (blue) token. To communicate with Application 1, the message needs to contain both tokens of communities A and B.

generalised TBN (gTBN) – basic functionalities

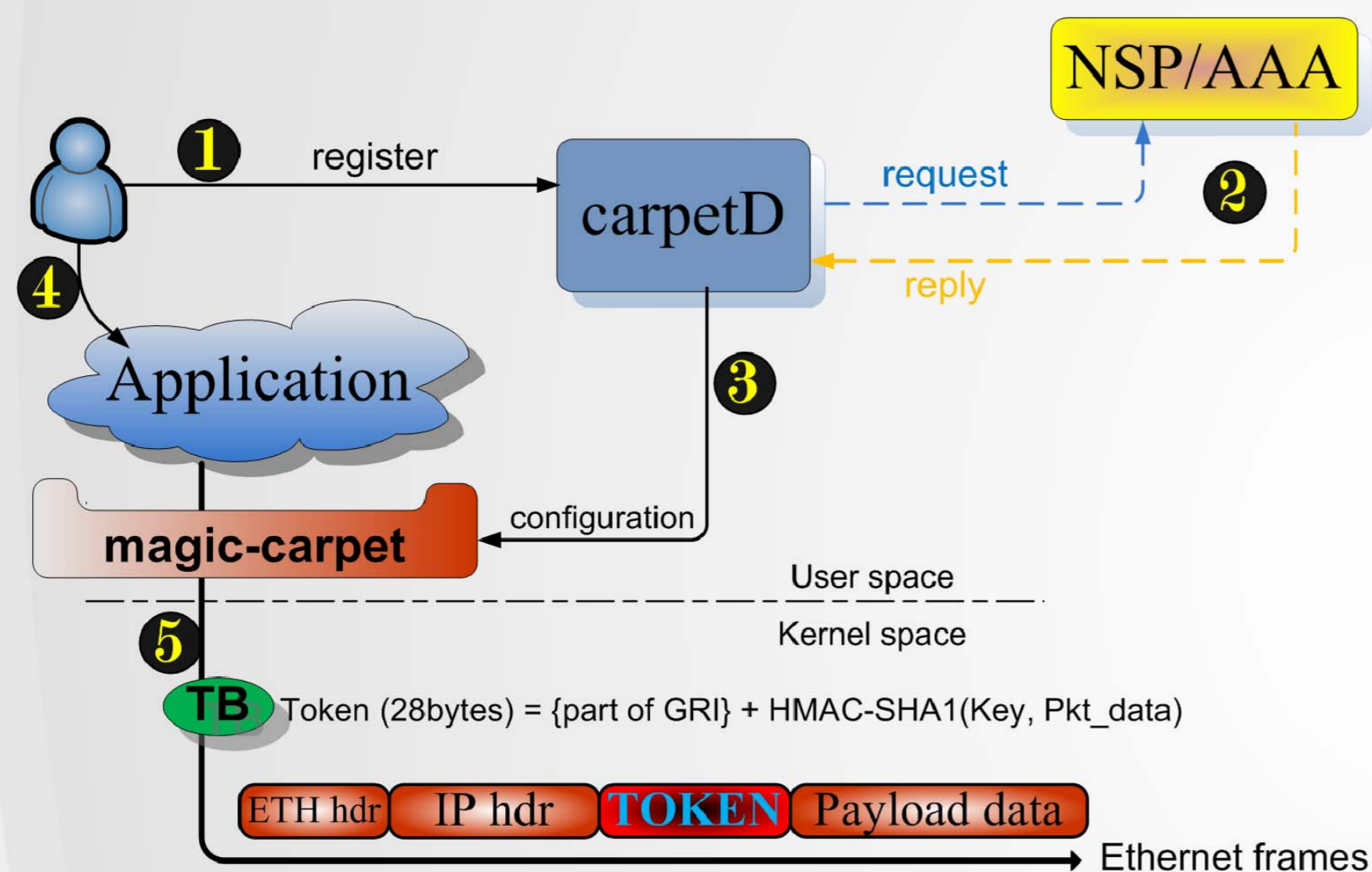
Application-specific services over heterogeneous networks:

- Resource reservation
- Dynamic resource provisioning for applications
- Need to support legacy applications

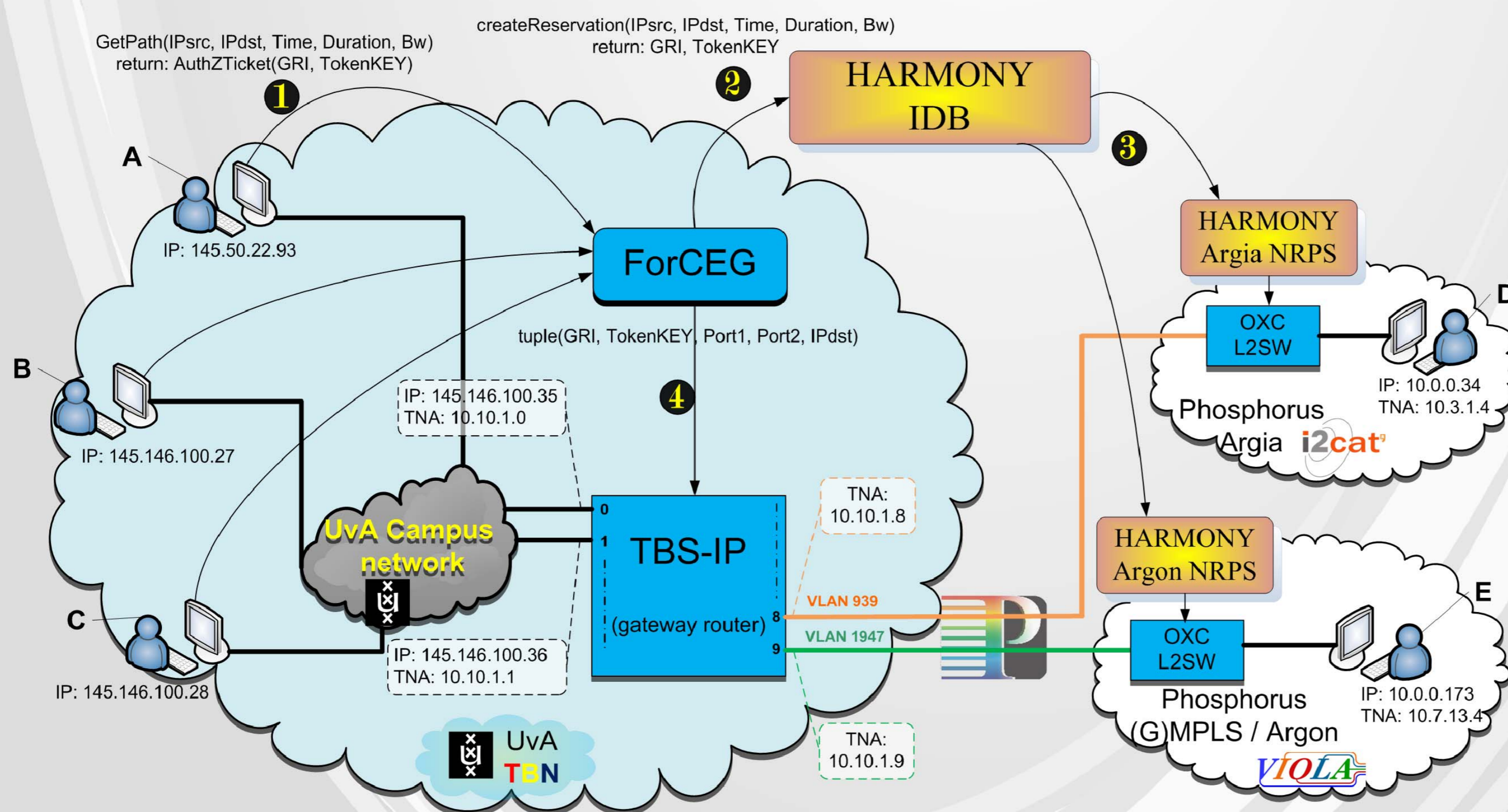
Orchestration between different parties:

- AAA infrastructure for coordinated network resource provisioning
- Secure binding of applications to networks
- Token-based traffic authentication and authorisation in hardware (NPU, FPGAs)
- Easy integration into multi-layer network access control infrastructures
- Integration into workflow management and grid middleware

Binding applications to lightpaths: magic-carpet



- 1 - User registers every application type which requires a lightpath onto carpet: e.g., application name | port numbers;
- 2 - **CarpetD** requests a lightpath for one application (as part of the registration process). It receives a pair **{GRI, Key}** from NSP;
- 3 - **CarpetD** prepares the **Magic-carpet** for the specific application;
- 4 - The user starts the application on the **Magic-carpet** environment
- 5 - When the application opens a socket and the carpet detects a bind to a lightpath, then the **TB** (token builder) module computes and inserts a Token into each outgoing packet.



- 1 – User applications (A, B, C) request paths to applications on hosts D, E across multiple network domains. Applications may share lightpaths;
- 2 – **ForCEG** authenticates the user's applications and requests paths to the Harmony authority on their behalf;
- 3 – **Harmony-IDB** prepares all intermediate domains involved in the path provisioning with the requested credentials (GRI, TokenKey);
- 4 – **ForCEG** provisions the data-plane (**TBS-IP**) that authenticates and routes application traffic.

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