

# GGIE - Glass to Glass Internet Ecosystem IETF94 BOF: November 3, 2015

Attendees:

- |  |                     |
|--|---------------------|
| Leslie Daigle (led the meeting)            | Glenn Deen          |
| Suzanne Woolf (IAB), early part of meeting | Wendy Seltzer (W3C) |
| Erik Nordmark (IAB)                        | Ted Hardie (IAB)    |
| Bill Rose (scribe)                         | Lixia Zhang         |
| Alissa Cooper (IAB)                        | Barry Leiba (IESG)  |
| Shane Kerr                                 | John Brzozowski     |
| Ralph Droms (IAB), later part of meeting   | ??                  |

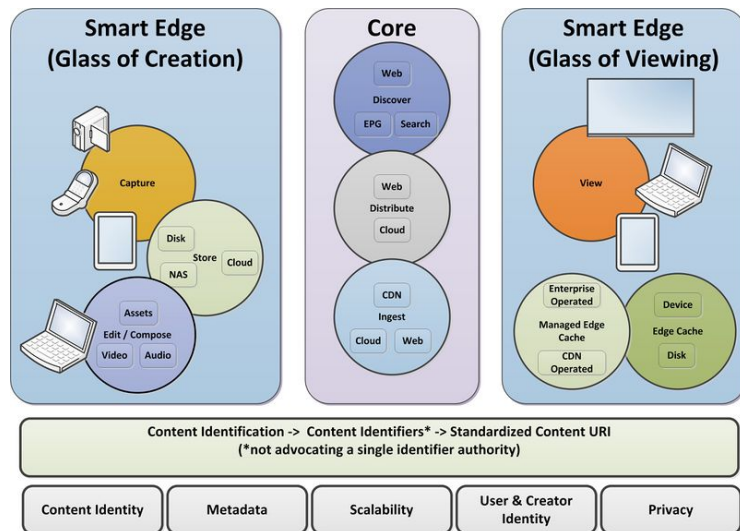
Agenda Bashing – There was no change to the agenda

Glenn Deen, Chairman of the GGIE IG, provided a presentation on GGIE

## 1. Motivation for GGIE

- Video is stressing the Internet globally: Olympics created 100M hours of Internet video viewing. 1000 times more bandwidth required to broadcast it all.
- Explosive growth in users, devices, data (SD->HD->4K->8K...) is creating a bandwidth problem. Just adding bandwidth isn't enough. Need to use the network more efficiently and intelligently

## 2. Glass to Glass Overview



- GGIE is suggesting the use of content identifiers and a standardized content URI to enable smarter, more efficient use of bandwidth

Question – Mentioned a user and creator ID? What are they?

Glenn Deen: Users can be creators as well as viewers of content in this context.

Question: Is professional producer part of this?

Glenn Deen: Yes. Professionals, private users and prosumers

### 3. GGIE History

- W3C Taskforce commissioned GGIE in 2014 under Web & TV Interest Group
- IGs (GGIE) cannot create specifications. We can either take the work to another group within W3C or to other SDOs such as SMPTE, ATSC, IETF, etc., that can write specs.

Leslie Daigle: This is the reason for today's discussion at the IETF.

Question: What about DRM?

Glenn Deen: DRM is out of scope but needs to be supported by solutions.

Follow up: But DRM does impact the solution so can't ignore it as solutions are discussed, developed.

Glenn: Newer DRM models are targeting making consumption easier (more transparent) as opposed to earlier solutions that were more restrictive.

Follow up: It can be transparent to user but still needs to be exposed to the transport mechanism.

- GGIE spent the past year examining the Digital Video Lifecycle: Capture-Edit-Store-Package-Distribute-Find-Watch
- Find GAPS in Standards that SDOs can work on to advance video
- 5 Focus points: Scalability, Content ID, Metadata, Identity, Privacy
- GGIE has developed a series of Use Cases that are publically available see [https://www.w3.org/2011/webtv/wiki/GGIE\\_TF](https://www.w3.org/2011/webtv/wiki/GGIE_TF) for more information and links to Use Cases

### 4. GGIE's Findings:

- Identified 3 high level gaps that are relevant at the IETF:
  - How applications identify, search for & refer to content
  - How devices locate and address video sources
  - How application level identifiers & network level identifiers are mapped to one another
- Identifying content for search, EPG & applications is different than identifying content for streaming, decoding, caching
  - Search-EPG-Applications focus is on names and work info – titles, language, version and related metadata
  - Streaming-Decoding-Caching focuses on format and delivery - addresses, codec, bit-rate, resolution, etc., attributes

Question: Interested in both?

Glenn Deen: Yes.

Question: Where do languages, subtitles, etc., fit?

Glenn Deen: Those are playback attributes. Can be included as a part of search.

Question: Is one a subset of the other?

Glenn Deen: No. they are separate and both are important to this work.

- A "Content URI" could be used to carry Video Content Identifiers used for Search, EPGs, & Applications. Useful for searches, program guides, libraries, linking metadata

- There are many sources and types of Video Content Identifiers today: EIDR, AD-ID, Service & CDN issued identifiers. Identifies the work, not the encoding.
- GGIE is not suggesting moving to a single Content ID. The idea is to simply ensure all content gets an ID.

## 5. Addressing Video

- Conflicting information regarding sources for the content
- Different codecs for different segments of the content; audio may come from a different source
- Playback can be composed of shards from different sources which need to be coordinated. Want to be able to identify which segments you want to come from each source.

Leslie Daigle: looking to make finding and delivering the bits of content easier by decomposing the application service into component parts

Glenn Deen: Nothing being discussed is revolutionary. It is evolutionary. We can do all of this with extensions to existing technology.

Participant: CDN solutions of today cannot be extended to solve these issues

Glenn Deen: Agree. The extensions are to existing technology that can help solve the issue of centralization at the CDN.

## 6. Device & Network level identifier for delivery – “Content Address”

- Ideally integrated with the network
- Each video shard has an address permitting direct addressing of shards
- A collection of shards is aggregated into a network of shards
- Permits devices & sources to use network for efficient delivery
- Looking to define a service that maps between the Content URI and the Content Address - a fundamental linkage between application level content and device level content with bi-directional resolution
  - Content URI::Content Address is a 1::Many relationship
  - Content Address::Content URI is a Many::Many relationship

## 7. GGIE Streamed Video

- Streamed content delivery can be viewed like a composed flow combining many parts with playback composed of one or more component streams from one or more addresses to one or more devices over one or more networks

Question: Does the client choose between the different addresses that map to a URI?

Glenn Deen: Search includes a content URI along with qualifying parameters. The URI is mapped to a number of content addresses that meet the parameters. The content manifest includes content the addresses instead of the address of the next server.

Participant: The current approach can embed the next shard in the content rather than in the manifest.

Glenn Deen: That can be supported with this approach.

Glenn Deen: There are multiple ways being explored to do this. For example, Cisco uses a gateway to provide a list of caches that may have the content. You visit each of the caches to

see if they have the shards to you need. When you get a hit, you access it from there.

Participant: There may be a scalability issue using segment routing. Depends on whether you are routing based on segment, shard, provider.

Leslie Daigle: Glenn is proposing a potential solution for discussion. It's a starting point.

Participant: It seems like a good idea to map to 128 bit identifiers but it doesn't necessarily follow it should be IPv6 routable addresses.

Glenn Deen: This is one potential way, not the only way. There may be better ways to do it. We want to get others involved to explore this and other ways that might solve the problem.

Participant: It might be useful to further devolve the problem statement. Breakout the separate problems and explore each.

Glenn Deen: That is what we did with the Use Cases we created.

Question: All of these techniques for video can be used for non-video delivery. Are we looking to extend this to other than video? E.g. health data, etc.

Glenn Deen: Video is what is stressing the network today. Solving it would benefit the Internet in general. Also, video has unique requirements.

Participant: Netflix is tolerant of drops/delays over mobile but not during the first second or two.

Glenn Deen: They play from a buffer. Live video does not.

Leslie Daigle: Video is the extreme example.

Participant: No. Game play is the extreme – you lose the game if there are losses, delays.

Participant: With respect to the 5 issues, we should separate out resource requirements from others. Prosumers versus pro.

Leslie Daigle: Part of the reason for this meeting now is not to set up a WG now. The question is what are the next steps to determine what is needed. Perhaps a BOF in Buenos Aires, Berlin?

Participant: BOF would be a good idea to inform the community.

Participant: Non-WG mailing group would be first step. Would be good to get eyes on it before doing a BOF.

Participant: Break it into smaller problems (nibbles). Some are easy to solve. Some more difficult – mapping service versus routing service. Figure out what can be done right away while discussing larger issues and how to attack.

Question: Can/will GGIE move into a standards group? Do you want to have a single group do the architecture?

Glenn Deen: No single standards group has a scope that would be inclusive of the work.

Question: Where do you think the decision will/should be made that all of the problems have been addressed, regardless of where they are solved?

Glenn Deen: The approach GGIE is suggesting is for the members of GGIE to take the various work items to the groups to which they belong that are best suited to do the work. It's a community approach where the community makes the proposals and decisions.

Barry Leiba: Shall we create a mailing list?

Leslie Daigle: Yes

**Action Item: Create non-Working Group mailing group.**

For more information please contact Glenn Deen at [glenn.deen@nbcuni.com](mailto:glenn.deen@nbcuni.com)