

464XLAT Optimization for CDNs/Caches

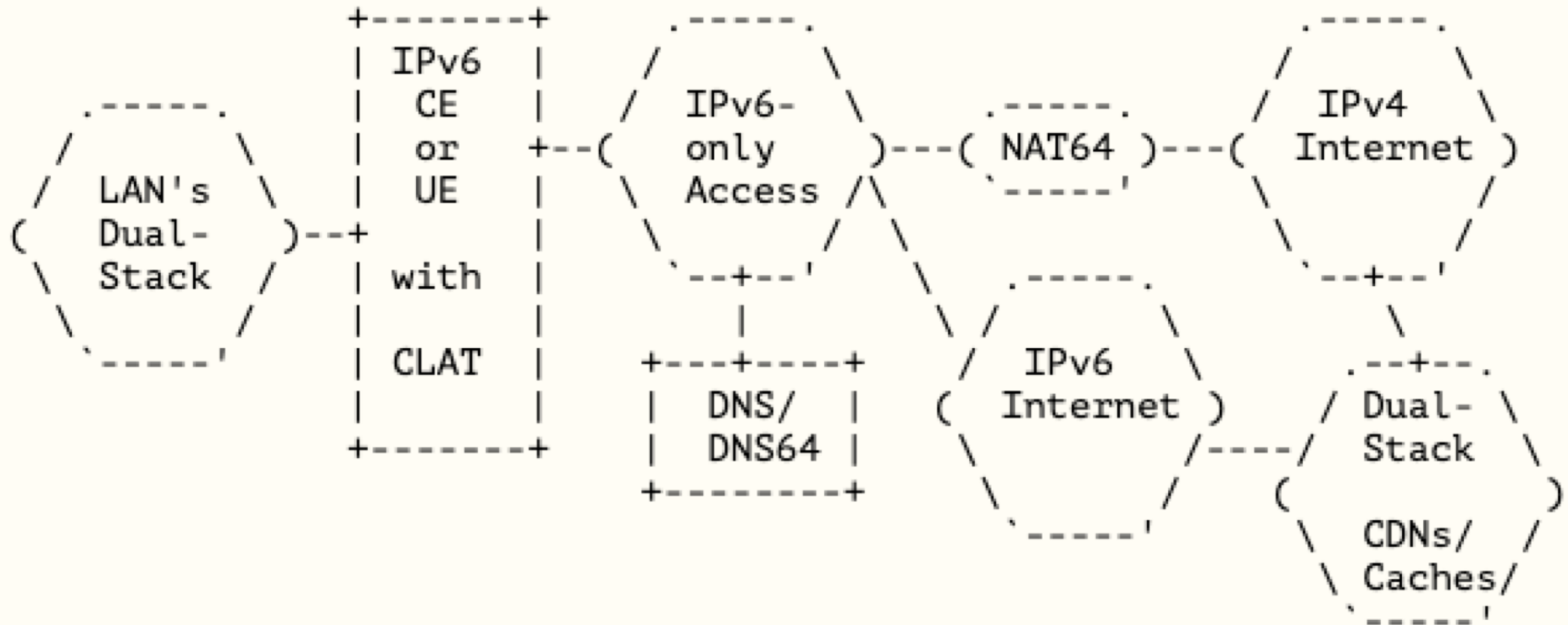
**draft-palet-v6ops-464xlat-opt-
cdn-caches**

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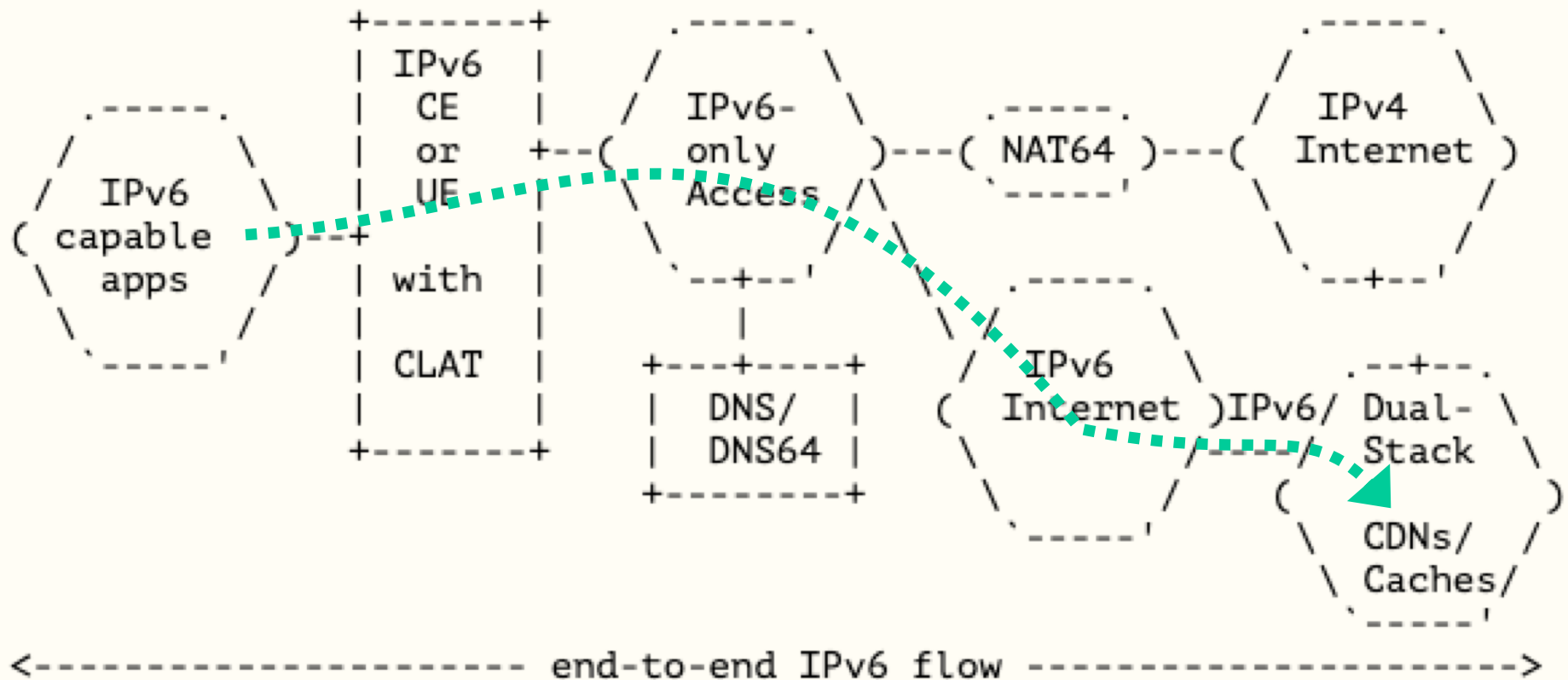
Problem Statement

- IPv4-only devices flows to dual-stack CDNs/Caches are terminated as IPv4, which means extra translations and the subsequent unnecessary overload
- In equivalent IPv4-only CGN use cases, the CDNs provide “private” addresses (typically 100.64.0.0/10) to avoid exactly the same issues

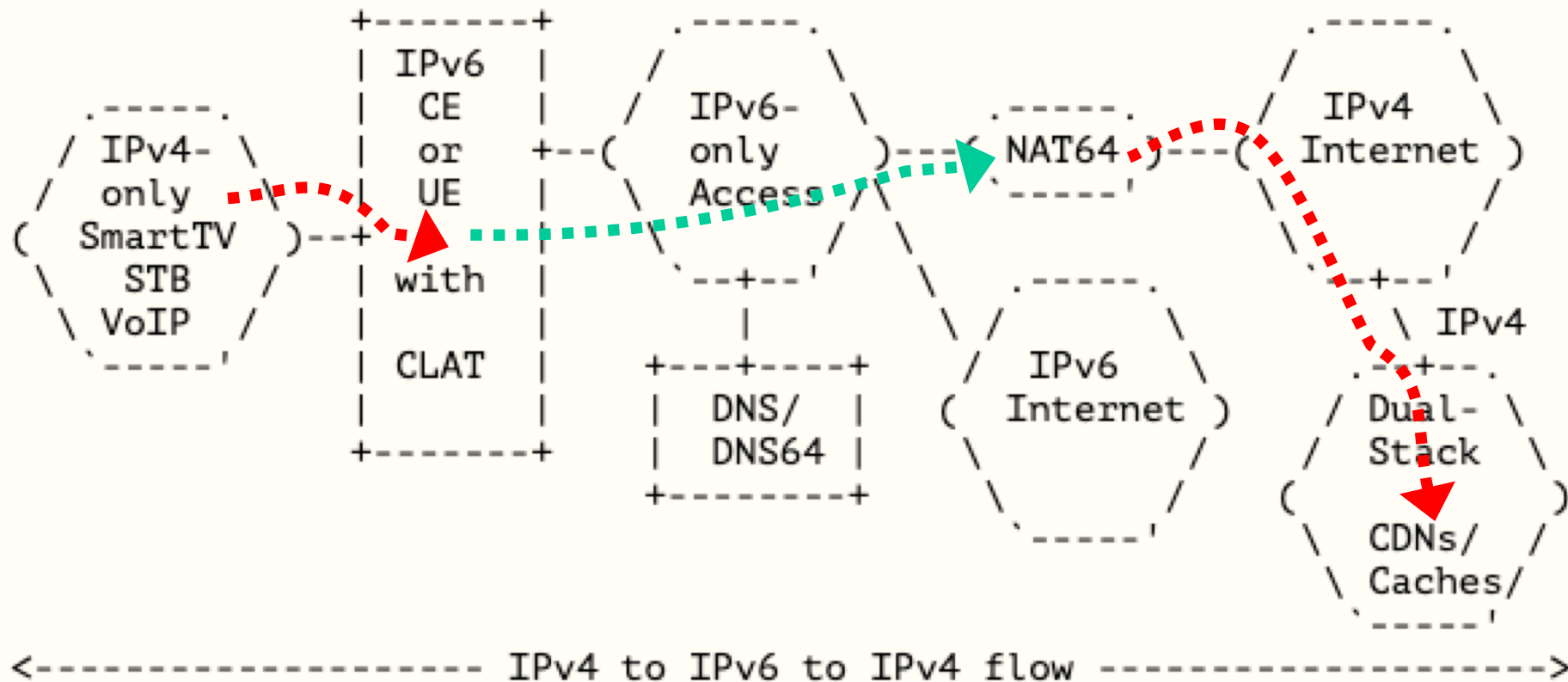
Typical 464XLAT Deployment



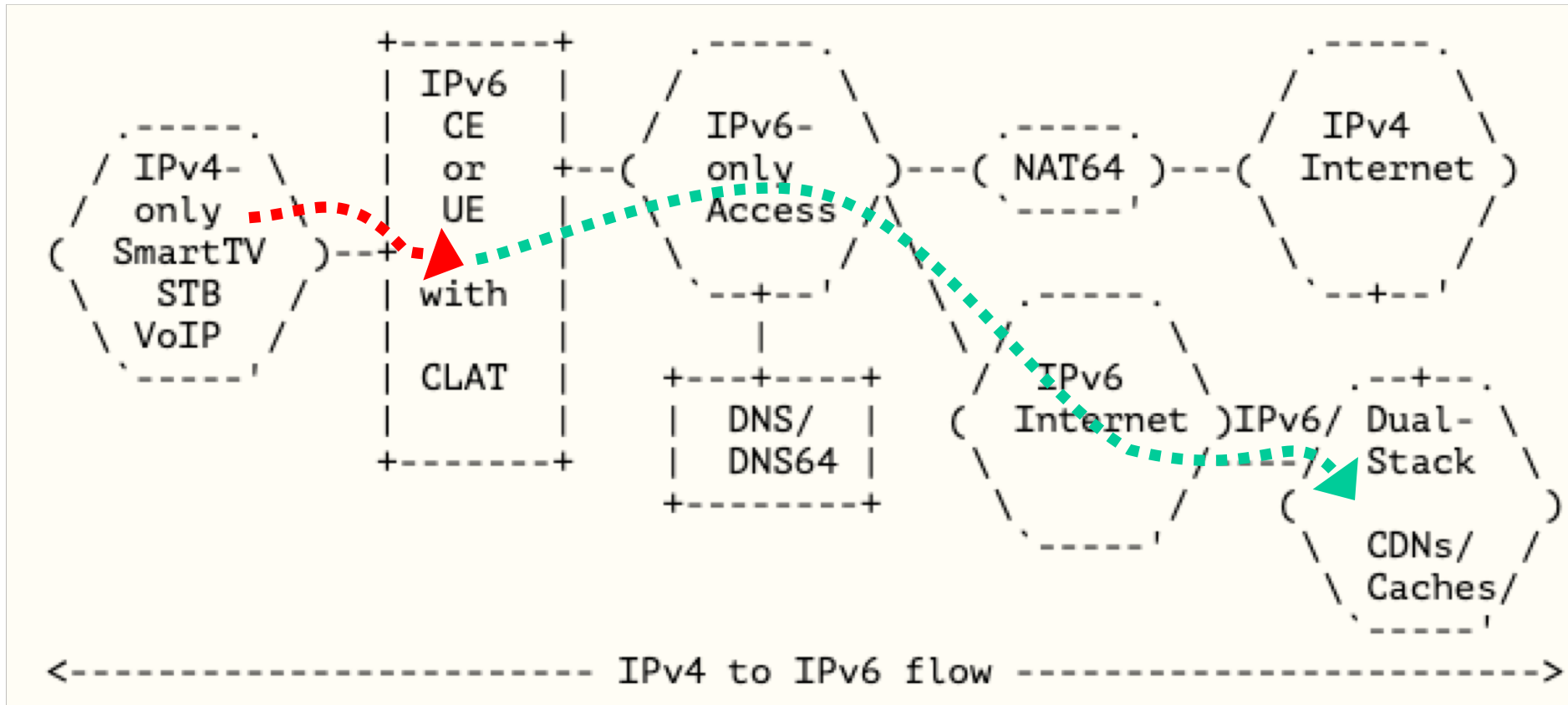
IPv6-Capable device



IPv4-only device

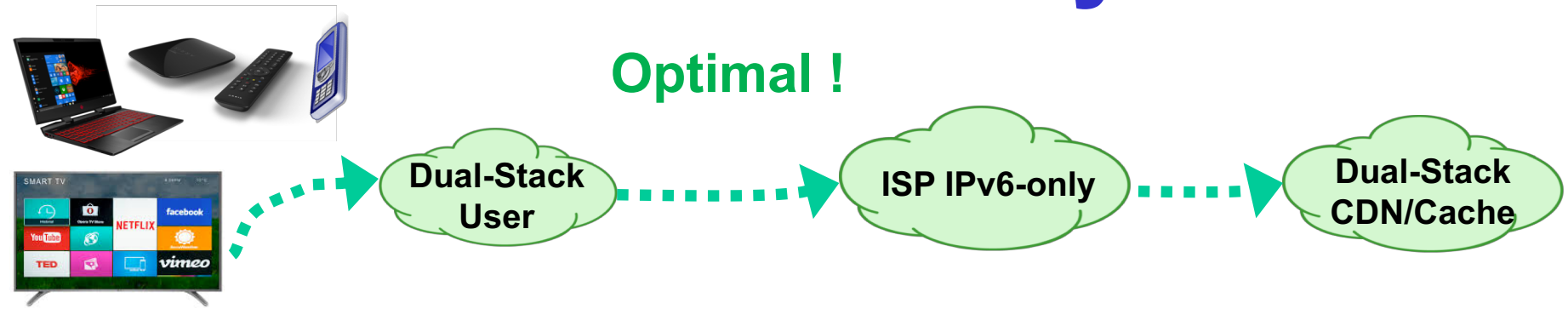


IPv4-only device (optimized)



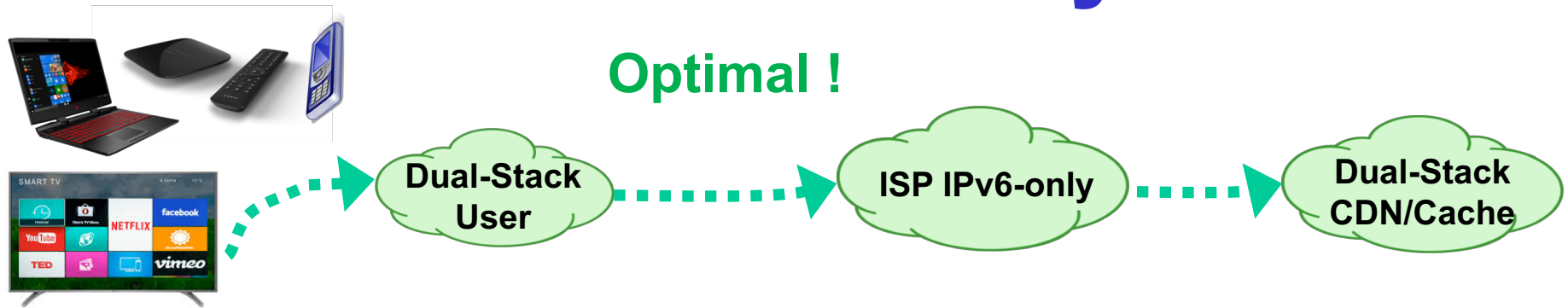
In Summary

Optimal !

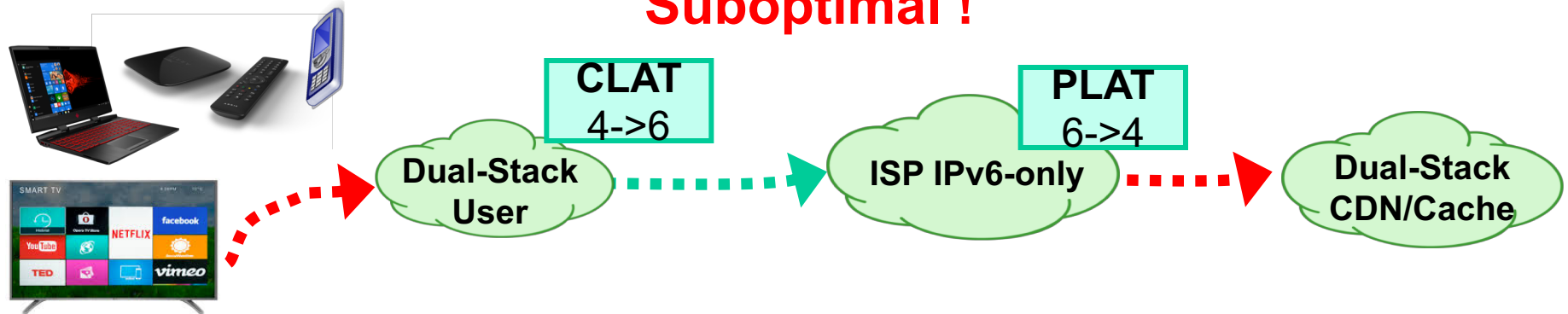


In Summary

Optimal !

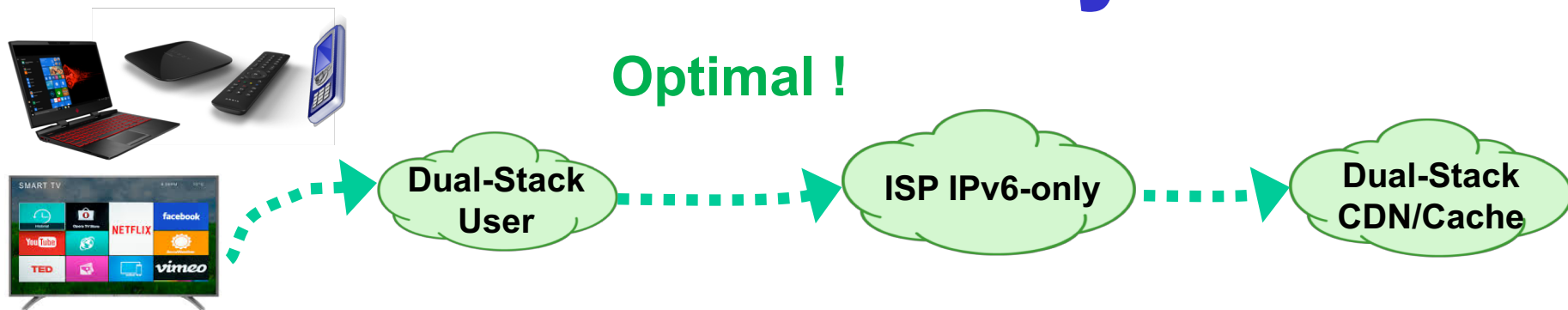


Suboptimal !

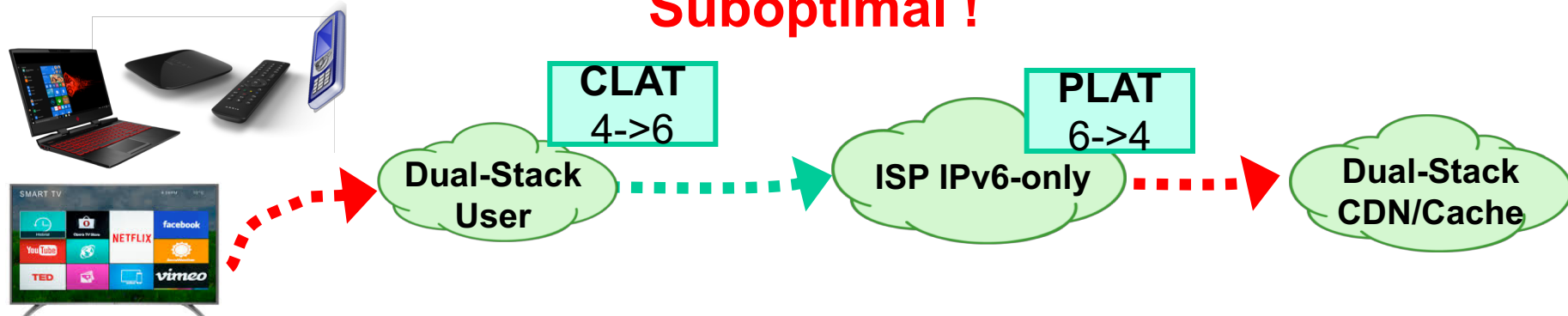


In Summary

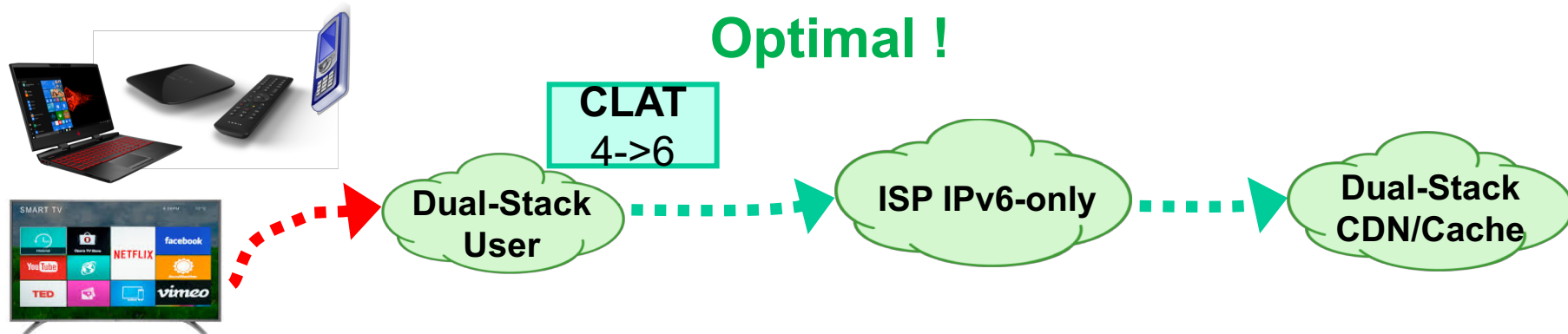
Optimal !



Suboptimal !



Optimal !



DNS/Routing-based Approach

- CLAT translate A records into AAAA:
 - WKP::A or NSP::A
- CDN/Cache provider configures dedicated interfaces to match WKP::A or NSP::A

www.example.com	A	192.0.2.1
CLAT translated to		64:ff9b::192.0.2.1
CDN IPv6 interface must be		64:ff9b::192.0.2.1
Operator must have a specific route to		64:ff9b::192.0.2.1

- **Issues:**
 - Only works if “local/private” connectivity
 - CDN/Cache provider needs to do “something”

CLAT/DNS-proxy-EAMT Approach

- CLAT detects queries only to A records while AAAA is also available (and do that query)
 - It is probably an IPv4-only device
- If response is not WKP/NSP, add to EAMT

www.example.com	A	192.0.2.1
	AAAA	2001:db8::a:b:c:d
EAMT entry		192.0.2.1 2001:db8::a:b:c:d
CLAT translated to		2001:db8::a:b:c:d
CDN IPv6 interface already is		2001:db8::a:b:c:d
Operator already has specific route to		2001:db8::a:b:c:d

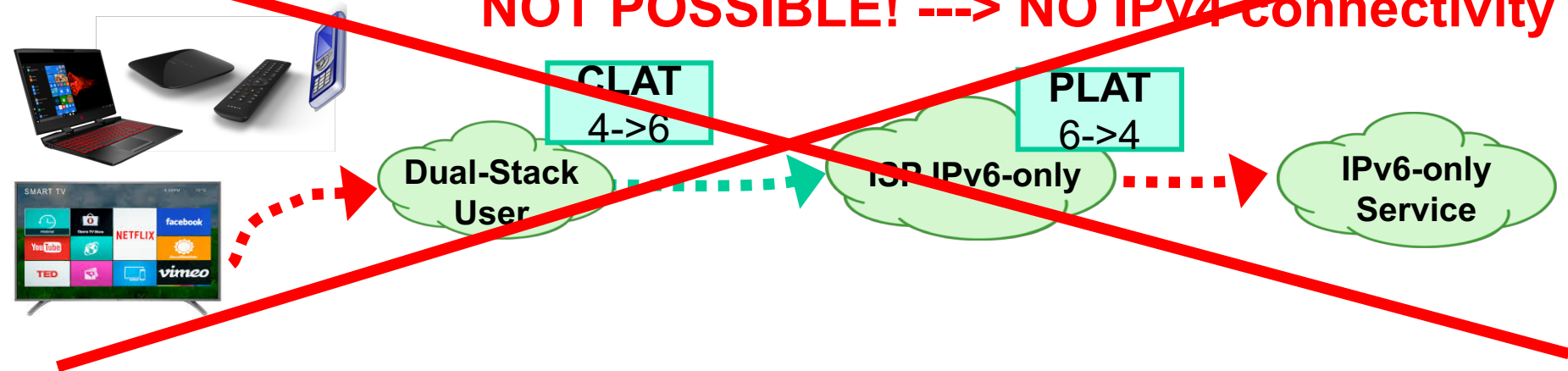
- Issue:
 - Devices with "manual" DNS will not take advantage
 - User don't typically change DNS in STBs, SmartTVs (break other things)
 - Even do, no harm is caused
 - If user change CE DNS, still works!
 - If operator uses "DNS views" other things broken!

CLAT-provider-EAMT Approach

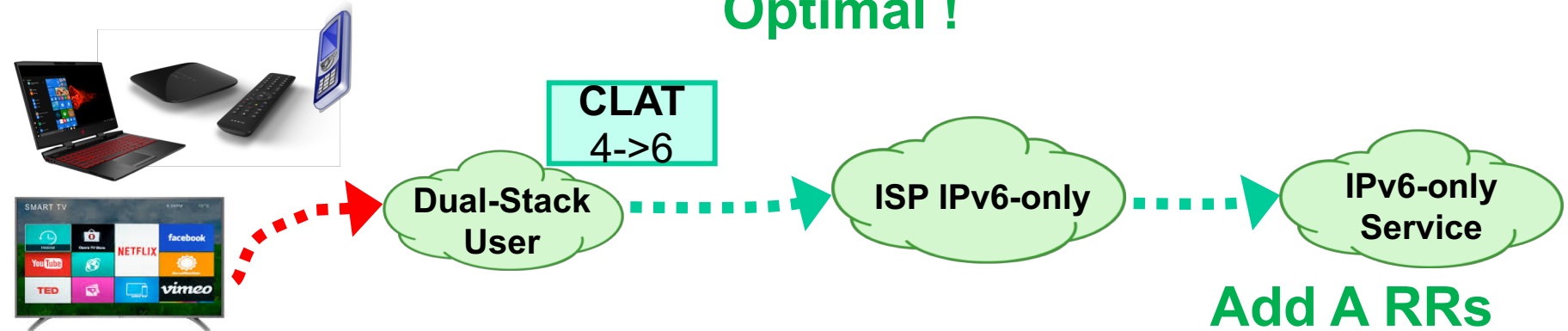
- Similar to previous one, but no "automated" EAMT
- Operator must push or CE must pull the table
- It will work even if user change DNS for STB, SmartTV, ...
- More control from the operator
 - EAMT pairs may be built "apart" from DNS
- Issues:
 - Increase complexity
 - Is the gains worth for it?
 - Need to add TTL (from DNS) to EAMT

Solution for IPv6-only Services?

NOT POSSIBLE! ---> NO IPv4 connectivity



Optimal !



**Add A RRs
even if IPv4 is
not available**

Risks

- IPv4-only devices will not fallback (no HE)
 - A misconfigured CE is not acceptable
 - Even a small % may bring the Content Provider to disable IPv6
- So ... failure cases need to be carefully considered

Conclusions

- CLAT/DNS-proxy-EAMT Approach seems the right approach.
- SIIT already has a SHOULD for EAMT support.
- 464XLAT maybe updated by this document so the CLAT has a MUST for EAMT support.
- Recommend having A “null” records for IPv6-only services in Internet?
 - Web page IPv4-only hosted by IETF showing “sorry this web page/service is only available from IPv6 enabled operators”

Next steps

- Co-authors:
 - Alejandro D'Egidio
 - Folks from CDNs
- Title change ?
- Become a WG item ?
- New inputs ?