

Seminar 2: TCP/IP versus OSI

In this seminar, we consider the text by Russell (2006) regarding OSI standards.

Q: Would the Internet we have today be much better if it was based on the ISO/OSI 7-layer model rather than TCP/IP?

Consider the availability, influence and impact of server and desktop tools and environments and where they came from (Commercial sources vs. Open source)

Personally, I do not think the internet would have been better where it based on the 7-layer OSI model. This position is motivated by a few considerations raised in the article by Russell (2006).

Standards Boards Context Points

- Internet Engineering Taskforce (IETF) disliked the complex and costly nature of OSI driven by the political concerns of ISO.
- ISO developed theoretical models that were difficult to implement or change, while IETF protocols were the result of discussions and testing.
- ISO standards processes were at odds against IETF processes because ISO processes were considered bureaucratic and political whereas IETF processes allowed for participants to raise proposals and not wait for standard to come from leadership.
- Tensions were exacerbated between the Internet Architecture Board (IAB) and IETF due to a disagreement about around IPv4 addressing and routing problems.
- OSI committees were viewed as overly bureaucratic and out of touch with existing networks and computers due to their political and formal process that did not endear the TCP/IP Internet community to the ISO Reference Model.
- OSI's development kept in line with IBM's own business interests. (Russell, 2013)

TCP/IP Context Points

- TCP/IP was favoured because of its use in the World Wide Web designed to take advantage of the Internet's end-to-end architecture.
- TCP/IP was developed through continual experimentation in a fluid organizational setting.
- The OSI Reference Model was defined only to standardize external interfaces between networks.
- There was strong opposition to the OSI model from within the Internet community.

Answer

Based on the points listed above, I summarise the failure of OSI was because:

1. It was developed by committee using rigid, bureaucratic, and slow ISO processes.
2. It was developed in line with IBM business interests (Russell, 2013).
3. Growth of the internet lead to Pouzin (1991) to state "it is easier and quicker to implement homogenous networks based on proprietary architectures, or else to interconnect heterogeneous systems with TCP-based products".
4. ARPA's adoption of TCP/IP in 1983 helped the downfall of OSI.
5. OSI product development included costs while Internet protocols could be developed for free.
6. OSI illuminated incompatibilities between idealistic visions of openness and the political and economic realities of the international networking industry.
7. OSI was unable to reconcile all requirements of all interested parties.

References

- Pouzin, L. (1991). Ten years of OSI—maturity or infancy? *Computer Networks and ISDN Systems*, 23(1-3):11-14.
- Russell, A.L (2013). OSI: The Internet that Wasn't: How TCP/IP eclipsed the Open Systems Interconnection standards to become the global protocol for computer networking. Available from <https://people.cs.clemson.edu/~jmarty/courses/papers/OSI-%20The%20Internet%20That%20Wasn%E2%80%99t%20.pdf> [Accessed 26 Dec. 2021]
- Russell, A.L. (2006). 'Rough Consensus and Running Code' and the Internet-OSI Standards War. *IEEE Annals of the History of Computing*. Available

from: <https://www2.cs.duke.edu/courses/common/compsci092/papers/govern/consensus.pdf> [Accessed 26 Dec. 2021]