



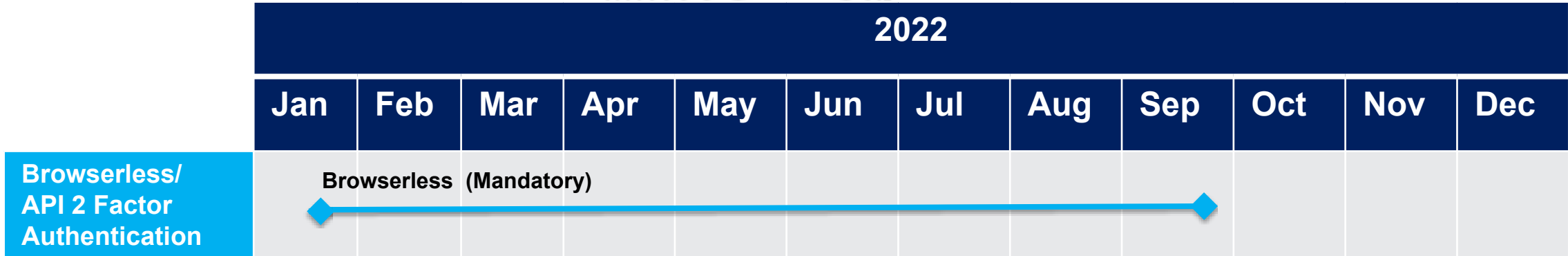
Browserless/API Two Factor Authentication (Public Key Infrastructure – PKI)

As of July 11, 2022

- Updated timeline to implement mandatory Public Key Infrastructure (PKI) for DR Hub, and Markets Gateway

Product - Action Required	Dates	Who May Be Affected
<p>Browserless/API Two Factor Authentication (Mandatory)</p> <ul style="list-style-type: none"> • Obtain valid PKI certificates from approved Certificate Authorities • Rewrite Browserless/API authentication code OR use PJM provided command line interface(CLI) • Make sure 2-Way SSL Connections, Client Certificates & Connection Renegotiation are enabled at Firewall & Security devices for outgoing PJM SSO traffic • Opt in now 	<ul style="list-style-type: none"> • Train: Completed • Production: June/July 	<p>Browserless users of</p> <ul style="list-style-type: none"> • Markets Gateway • InSchedule • Power Meter • FTR Center • Capacity Exchange • DR Hub • MSRS





Legend

- Start Date
- ◆ End Date

Change impacts only Browserless transfers

Web
Browser

- **Source:** Web browsers
- **Authentication Mechanism:** Password + Soft Token(One Time Password)

Browserless

- **Source:** Machine to Machine
 - Interactions with PJM web service Application Programming Interfaces (APIs) via custom code or PJM Command Line Interface (CLI)
- **Authentication Mechanism:** Password + Certificate using Public Key Infrastructure (PKI)

InSchedule

DR Hub

MSRS

Power
Meter

FTR
Center

Market
Gateway

Capacity
Exchange



2022 Dates for Mandatory PKI/Two-Factor cutover

Product	Train	Production
InSchedule	January 6 at 4 p.m. (complete)	July 13 at 4 p.m.
Power Meter	January 6 at 4 p.m. (complete)	July 13 at 4 p.m.
FTR Center	January 13 at 4 p.m. (complete)	June 28 at 4 p.m. (complete)
DR Hub	February 2 at 4 p.m. (complete)	September 21 at 4 p.m.
Capacity Exchange	January 13 at 4 p.m. (complete)	June 28 at 4 p.m. (complete)
MSRS	January 20 at 4 p.m. (complete)	July 20 at 4 p.m.
Markets Gateway	January 18 at 4 p.m. (complete)	August 28 at 4 p.m.

- PKI Certificates and PKI/Two-Factor Browserless/API [FAQs](#)
- PKI Authentication [Guide](#)
- Exporting public [keys](#)

Facilitator:

Todd Keech, Todd.Keech@pjm.com

Secretary:

Risa Holland, Risa.Holland@pjm.com

SME/Presenter:

Sunil Kumar Rachakonda

SunilKumar.Rachakonda@pjm.com

Tool Security Changes



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

**PROTECT THE
POWER GRID
THINK BEFORE
YOU CLICK!**



Be alert to
malicious
phishing emails.

Report suspicious email activity to PJM.
(610) 666-2244 / it_ops_ctr_shift@pjm.com



- If a user accesses the tools only through the User Interface (UI), is a PKI certificate needed? **No.**
- If a user accesses the tools using both the UI and browserless interfaces, is a PKI certificate needed? **Yes.**
- Do system accounts (used to access browserless interfaces) need a PKI certificate? **Yes**
- If a user access browserless interfaces using multiple usernames, is a separate PKI certificate needed for each username? **Yes.**
 - If that user creates a SUMA account for those multiple usernames, how many PKI certificates are needed? **One (1) for the SUMA username**
- Can PKI certificates be shared between different usernames? **No. It is username specific.**

- If a user access multiple PJM tools with the same username, how many PKI certificates are needed? **One (1). It is username specific, not tool specific.**
- Do all usernames under an account need to use a PKI certificate at the same time? **No. PKI certificate is username specific, each username can start independently.**
- The username in Train is different from the username in Production, can I use the same PKI certificate? **Yes.**
- Once a PKI certificate is added to a username, does it work for all PJM Tools under that user or only certain ones? **Impacts all PJM Tools.**
- What happens if a user attempts to access a browserless interface without a certificate? **The user will get authentication errors.**
- Do the all PKI certificates have to be from the same vendor? **No.**

- Do users need to go through the 'opt-in' period? **No. However, it will allow for a sense of certainty about how this implementation works before it becomes mandatory.**