Tools Security Roadmap

February 21, 2020
Sunil Rachakonda
<table>
<thead>
<tr>
<th>Product - Action Required</th>
<th>Dates</th>
<th>Who May Be Affected</th>
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| ExSchedule & OASIS       | Q3, 2020 | • Users of ExSchedule and OASIS  
| • Obtain valid PKI certificates from approved Certificate Authorities  
| • Rewrite Browserless/API authentication code  
| • Use PJM provided command line interface (CLI) | | • 3rd-party Vendors for ExSchedule and OASIS  
| | | • Developers of ExSchedule and OASIS Browserless/API code |
| Account Manager          | Q3, 2020 | • Users of ExSchedule and OASIS  
| • Associate valid PKI certificates with user account in Account Manager | | |


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<tr>
<td><strong>PKI for OASIS &amp; ExSchedule</strong></td>
<td>Development and Testing</td>
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<td>Train &amp; Member Testing: TBD</td>
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- **Train & Member Testing:** TBD
- **Prod:** TBD
- **Prod (Opt-In):** TBD
ExSchedule & OASIS Public Key Infrastructure (PKI)

Browserless/API 2 Factor Authentication
• PKI
  – On February 4, 2020 FERC issued order to comply with NAESB 3.2 changes
  – Implement PKI to provide secure access to
    • OASIS
    • E-Tagging applications (ExSchedule)
  – Existing certs that meet NAESB requirements will be accepted
  – When:
    • Train: Q3, 2020
    • Production: Q4, 2020
• Browserless/API 2 Factor Authentication
  – Leverage PKI solution
  – Scope
    • Included: All PJM Tools that are part of Single Sign On and have Browserless APIs
    • Excluded: ExSchedule and OASIS
  – When:
    • Optional in Q4, 2020
    • Mandatory in 2021
FAQs

• https://www.pjm.com/-/media/etools/security/pki-faqs.ashx?la=en