Tools Security Roadmap

January 16, 2020
Sunil Rachakonda
<table>
<thead>
<tr>
<th>Product - Action Required</th>
<th>Dates</th>
<th>Who May Be Affected</th>
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</table>
| ExSchedule & OASIS                               | Q3, 2020| • Users of ExSchedule and OASIS  
• 3rd-party Vendors for ExSchedule and OASIS  
• Developers of ExSchedule and OASIS Browserless/API code |
| • Obtain valid PKI certificates from approved Certificate Authorities |         |                                                                                     |
| • Rewrite Browserless/API authentication code     |         |                                                                                     |
| • Use PJM provided command line interface (CLI)   |         |                                                                                     |
| Account Manager                                  | Q3, 2020| • Users of ExSchedule and OASIS  
                                                                                     |
| • Associate valid PKI certificates with user account in Account Manager |         |                                                                                     |
# 2020 Tentative Roadmap

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<thead>
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<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
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<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
<tr>
<td>PKI for OASIS &amp; ExSchedule</td>
<td>Development and Testing</td>
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<td>Train &amp; Member Testing: TBD</td>
<td>Prod: TBD</td>
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<tr>
<td>Browserless/API 2 Factor Authentication</td>
<td>Development and Testing</td>
<td>Train &amp; Member Testing: TBD</td>
<td>Prod (Opt-In): TBD</td>
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ExSchedule & OASIS Public Key Infrastructure (PKI)

Browserless/API 2 Factor Authentication
• PKI
  – FERC Notice of Proposed Rule Making (NOPR)
  – Implement PKI to provide secure access to
    • OASIS
    • E-Tagging applications (ExSchedule)
  – PJM intends to comply
  – 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