Abstract: In the presented thesis we study taken over solutions of available compactification methods on the Schwarzschild's spacetime and we discuss their properties and analytical structure. Furthermore, we introduce a method of construction of coordinates based on analytical requirements placed on the resulting metrics. This procedure is being discussed and applied to Schwarzschild's spacetime. Next we apply it to the compactification of the Reissner's – Nordström's spacetime and discuss its analytical coverage of the spacetime. Finally, we show a method based on the theory of differential equations to verify the analytical structure of the metric coefficients on the $\mathscr{I}^{\pm}$.